ASSESSING COLLABORATIVE GOVERNANCE THROUGH ALTERNATE RATIONALES:

A CASE STUDY OF WATERSHED PARTNERSHIPS IN HAWAIʻI

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DEDICATION

I dedicate this work to my family. To Philip Anthony Kaehukai Broadhurst, who supported my choice to wrestle with this amazingly complex and challenging undertaking, and unfailingly encouraged me. I also dedicate this work to Nicholas Kaimanaʻakealoha Bolduc-Broadhurst, our son – I hope this research and manuscript are inspirational to you, and demonstrative of how rewarding dedication to work you believe in can be. To Maman and Papa, as well as my eight brothers and sisters, and my entire Hawaiʻi family.

Note: This research attempts correct use of Hawaiian diacritics for place names and commonly used words. Technically, some legal names – such as "State of Hawaii" – do not use the Hawaiian diacritics. But to avoid confusion and the appearance of inconsistency, diacritics for all names will be used hereafter.

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ABSTRACT

Collaborative governance approaches to large-scale resources management such as watershed planning have been increasingly studied, promoted, and implemented in recent years, with varying degrees of success. Specifically, researchers have struggled with generating meaningful evaluative mechanisms to measure the accomplishments of these endeavors involving stakeholders with competing mandates, including disparate values, power imbalances, and difficulties with measuring or quantifying on-the-ground improvements. This dissertation examines rationales for decision-making of collaborative governance efforts, and ultimately, how these rationales frame the approach used to evaluate the success of these efforts. The research uses the case of a collaborative natural resource management group, an association of watershed partnerships in the State of Hawai‘i consisting of ten partnerships across five islands. The study explores the decision-making process through the activities and management outcomes of this collaborative group, through the lenses of *equity*, *efficiency*, *democracy*, and *ecological integrity* -- all prevalent and widely endorsed, yet at times possibly conflicting, rationales for working in groups to address common goals, especially in the case of environmental management. Rationale, for this research represents the sets of underlying motivations utilized by various stakeholders participating in and/or evaluating these efforts. The research looks at the extent to which Hawai‘i’s watershed partnerships are successful at managing upper watershed areas through four rationale-based theories of change. The four theories of change, stemming from a unique implementation theory (characterized as activities) inform the evaluative framework within which the collaborative effort is assessed. Results from the research demonstrate that despite being restrictive in regard to membership, Hawai‘i’s Watershed Partnerships fare more favorably when assessed under an equity and democracy rationale than through an efficiency or ecological integrity rationale. However, the study finds that as collaborative processes ideally include broad representation to promote collective goals, evaluating the success of collaborative efforts should also reflect the broad and variable motivations and values of multiple stakeholders, and should also employ a variety of approaches to measure their outcomes.

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LIST OF ACRONYMS AND ABREVIATIONS

CIP	Capital Investment Project
CNRM	Collaborative Natural Resource Management
CBNRM	Community Based Natural Resources Management
DBEDT	Department of Business, Economic Development & Tourism
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DURP	Department of Urban and Regional Planning
EA	Environmental Assessment
EIS	Environmental Impact Assessment
EMWP	East Maui Watershed Partnership
EMoWP	East Molokaʻi Watershed Partnership
FEA	Final Environmental Assessment
FEIS	Final Environmental Impact Statement
FY	Fiscal Year
HAR	Hawaiʻi Administrative Rules
HAWP	Hawaiʻi Association of Watershed Partnerships
HEPA	Hawaiʻi Environmental Policy Act
HRS	Hawaiʻi Revised Statute
KMWP	Koʻolau Mountains Watershed Partnership
KWA	Kauaʻi Watershed Alliance
KWP	Kohala Watershed Partnership
LFWP	Lānaʻi Forest and Watershed Partnership
LHWRP	Leeward Haleakalā Watershed Restoration Partnership
MWA	Mauna Kea Watershed Alliance
NAPP	Natural Area Partnership Program
NARF	Natural Area Reserves Fund
NARS	Natural Area Reserves System
NGO	Non-Governmental Organization
NPG	New Public Governance
NPM	New Public Management
NRCS	Natural Resources Conservation Services
NRM	Natural Resources Management
PCSU	Pacific Cooperative Studies Unit
TMA	Three Mountain Alliance
TNC	The Nature Conservancy
UHM	University of Hawaiʻi at Mānoa
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Services
WHI	Watershed Health Index
WMWP	Waiʻanae Mountains Watershed Partnership
WMMWP	West Maui Mountains Watershed Partnership
WPP	Watershed Partnership Program

CHAPTER 1: INTRODUCTION

This dissertation examines rationales for decision-making through the ensuing outcomes of collaborative governance efforts, and ultimately, how these rationales frame the approach used to evaluate the success of such efforts. The research uses the case of a collaborative natural resource management group, an association of watershed partnerships in the State of Hawai‘i consisting of ten partnerships across five islands. The study explores the activities and management outcomes of this collaborative group, through the lenses of *equity*, *efficiency*, *democracy*, and *ecological integrity* -- all prevalent and widely endorsed, yet at times possibly conflicting rationales for working in groups to address common goals, especially in the case of environmental governance. Rationale, for this research represents the sets of underlying motivations utilized by various stakeholders participating in and/or evaluating these efforts. The research looks at the extent to which Hawai‘i's watershed partnerships are successful at managing upper watershed areas through four rationale-based theories of change. The four theories of change, stemming from a unique implementation theory (characterized as activities) inform the evaluative framework within which the partnership is assessed. Ultimately, the research seeks to offer planners and evaluators (academics and practitioners) additional tools to evaluate the success of collaborative natural resource governance efforts.

Collaborative governance approaches to large-scale resources management such as watershed planning have been increasingly studied, promoted, and implemented in recent years, with varying degrees of success. Specifically, researchers have struggled with generating meaningful evaluative mechanisms to measure the accomplishments of endeavors involving stakeholders with presumably competing mandates, including disparities in values, power imbalances, and difficulties with measuring or quantifying on-the-ground improvements. This research seeks to offer a new way for evaluators to assess these new institutions; doing away with sanctioning collaboration as panacea of its own, leading to prevalent use of process-driven

indicators of group success in evaluation and natural resource management (NRM) research, and propose a more comprehensive assessment that includes long-term environmental outcomes. The results of this research are envisioned to be of value to the State of Hawai‘i’s Watershed Partnership Program (WPP), as well as to evaluators and other researchers involved in assessing the success of these types of efforts. This next section will situate the case study for this research, a collaborative natural resource management (CNRM) effort that has not been comprehensibly studied and for which an evaluation has never been attempted.

1.1 The Rain Follows the Forest: Hahai nō ka ua i ka ululā‘au

According to the State of Hawai‘i’s Department of Land and Natural Resources (DLNR), “Hawai‘i’s water supply is at risk” (State of Hawai‘i, DLNR, 2011, p.2). Recent research has shown that rainfall has steadily declined in Hawai‘i over the last century (Giambelluca et al., 2012). Moreover, Hawai’i’s groundwater supply is being depleted at an alarming rate, which has accelerated over the last few decades (see for example, research on the Pearl Harbor aquifer, which supplies the majority of Oahu’s municipal water, showing that withdrawals from the Pearl Harbor aquifer [Waimalu] have exceeded the State’s sustainable-yield estimate for that location of 45 million gallons per day) (Oki, 2005). In its 2011 Plan to Replenish Hawai‘i’s Source of Water entitled *The Rain Follows the Forest*, DLNR explained:

> Our fresh water supply, revered and relied upon since the first ancient Hawaiians arrived on these islands, is declining. If this trend continues, future generations will not have access to water at reasonable rates, and may face tight restrictions. Agricultural, residential, commercial, cultural, and conservation uses are already competing over their share of a shrinking water supply (…) Scientists predict that climate change will further decrease the future supply of our water resources. At the same time, the demand for these resources will increase. Hotter and drier conditions will increase irrigation demands. Rising sea levels will turn coastal water sources brackish, further threatening fresh water supplies. (…) Investing in the protection of fresh water sources must be the highest priority for Hawai‘i’s public leaders and the DLNR. Forest protection and restoration is the most cost-effective

> action to alleviate the threats to Hawai‘i’s water sources. (State of Hawai‘i, DLNR, 2011, pp.2-3)

Additionally, the Hawaiian landscape has been modified to such an extent over the last century that tropical forests have become increasingly alien-dominated by both invasive plants and animals. Many feral ungulates (such as pigs, goats, and cattle), which were brought to Hawai‘i in the latter part of the nineteenth century have thrived, lacking any natural predators, disturbing ground cover, and creating spaces for invasive trees, weeds and plants to gain a foothold and propagate. Furthermore, alien plants are aggressive and often consume more water than native or endemic plants (for example the strawberry guava tree (*Psidium cattleyanum*), Hawai‘i’s most invasive plant uses 25% more water than the average native forest plant) (State of Hawaii, DLNR, 2011).

Thus, Hawai‘i’s native forests need to be protected, and the State government has attempted to adopt new modes of governance to safeguard the resource.[1] In order to most-effectively address and potentially reverse the impacts of ongoing forest degradation, the DLNR Plan hoped to direct approximately $11 million per year (by 2021) through its Division of Forestry and Wildlife (DOFAW) to support voluntary alliances of public and private landowners/managers cooperation to manage millions of acres (approximately 2 million acres, or about half of Hawai‘i’s land base). The appropriation specifically encourages working across ownership boundaries; leveraging State efforts; pooling of funding; and providing a diverse range of local jobs.

Extensive academic research over recent decades has established the effectiveness of natural resource collaborative governance, suggesting these arrangements can advance more equitable, efficient, effective, and even more fair outcomes, notably in management of broad-scale ecosystems such as watersheds, forests

[1] Under the Public Trust Doctrine (HAW. CONST. art. IX, § 1), the State of Hawai‘i serves as a trustee maintaining common resources for the benefit of current and future generations.

and fisheries (Agrawal & Ribot, 1999; Berkes, 2009; Weber, 2000). Planning research also suggests such collaborative efforts effectively promote stakeholder participation, resulting in better decision-making, greater consensus, and more community empowerment (Innes, 1995; Forester, 1999; Fung & Wright, 2003). Collaborative natural resources management (CNRM) – i.e., resource management that involves multiple stakeholders across various sectors – has emerged over the last 25-30 years as vital to more inclusive and effective planning for common pool resources, and has increasingly been embraced and adopted across the United States.

Some researchers or analysts have nevertheless challenged the benefits of CNRM, at times revealing a weak relationship between increased representation and tangible opportunities for stakeholders to exert real influence in management decisions (Lockwood et al., 2010; Quick & Feldman, 2011). Such research asserted that an inclusionary collaborative process does not necessarily guarantee a just process or just outcomes (Healey, 2003). Shortcomings have also included "many conflicting agency goals and missions, inflexible administrative and legal procedures, and constrained financial resources" (Gerlak & Heikkila, 2006). There are also researchers that have noted that collaborative planning endeavors often do not show successes in implementation, and that attention needs to be paid to implementation outcomes (Harris, 2002).

Many nonetheless still support these arrangements, justifying their use with one of more of four general rationales: (1) to promote equitable outcomes for socio-economically disadvantaged groups; (2) to promote greater accountability, transparency and efficiency especially for public institutions; (3) to address environmental problems collectively as common resources such as water and forest may benefit all, but may not always be exploited by all; and (4) to endorse a democratic process that promotes equality, freedom, and justice. These rationales have consistently and historically informed the way we perceive, participate in, and evaluate the success of these new types of arrangements in which a single actor may be ill-equipped to address complex issues individually, but presumed to be more successful when acting in a group to collectively address shared objectives.

Existing governance policies and activities aimed at managing resources on the ground may at times have inadvertently generated unforeseen and even adverse consequences for community members living within a given managed area. There are potential trade-offs in the benefits they bring. This can be particularly consequential in regions where subsistence farming and rural lifestyles endure, or where stakeholders are socio-economically disadvantaged, and/or politically weak and therefore more vulnerable from an equity and community welfare perspective (Berkes, 2009; Armitage et al., 2008). While public institutions are required to protect public resources for the common good, many frequently operate far distanced from the places, values, and interests of the people and resources they manage. This is particularly true in Hawai‘i, where policy making occurs on one island yet impacts stakeholders in all four counties across six main islands. In certain cases, critical stakeholders may be excluded from management decisions that directly impact them. Careful consideration of how public funds are disbursed and who will benefit from these funds is vital for effective decision-making.

This research examines whose values are heard or submerged in governance processes; how decisions are made; and under what rationale, in order to promote a more holistic approach to evaluating the success of CNRM efforts. Essentially, the inquiry assesses the outcomes of activities conducted by a CNRM effort in the State of Hawai‘i, with funding received by a public agency, keeping in mind that various stakeholders have different motivations for participating in a collaborative effort. The study observes these stakeholder motivations under the rationales of equity, efficiency, democracy, and ecological integrity: four possible rationales for collaborating.

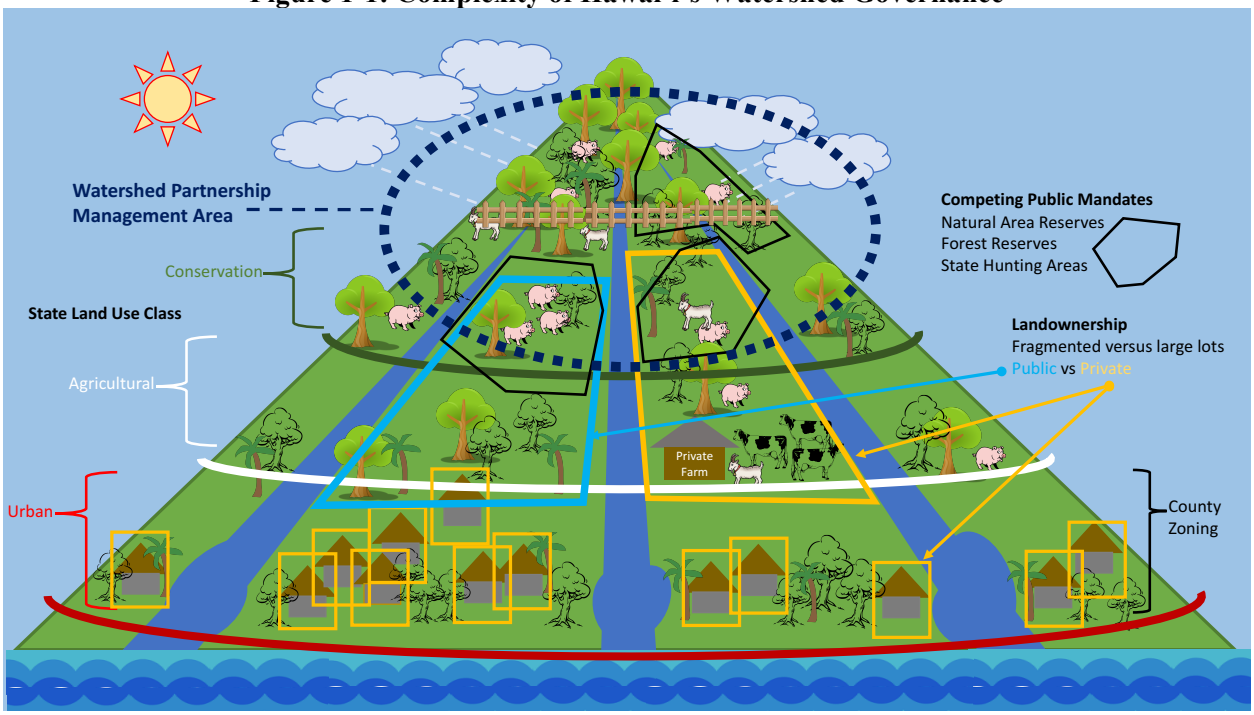
Furthermore, research on collaborative institutional arrangements has largely focused on identifying successes and consequences of the collaborative approach to environmental governance in an often isolated, field-specific manner. Evaluative methods for assessing the degree to which these new arrangements have proven more successful than earlier models have yet to generate more holistic evaluative approaches upon

which we might further conceptualize evaluative designs. Much of the evaluation research on CNRM has focused on the degree to which these institutional arrangements have met their mission statements; limited themselves to either normative or substantive indicators of success (at best); or investigated whether these new institutional models have led to more favorable outcomes (based on an idealized basis for collaborating). Little attention has yet been paid to the underlying motivations which may drive how we operationalize the measurement of the success of these efforts. This research revisits assumptions about how we measure the success of these arrangements, in the process potentially promoting a more holistic, integrated, comprehensive understanding of seeing problems we face and social realities we encounter, depending on the foundation or rationale upon which we base our assessment.

1.2 Hawai‘i’s Complex Watershed Governance

This research studies a particular collaborative effort in Hawai‘i, the Hawai‘i Association of Watershed Partnerships (HAWP), to examine how management decisions actually transpire on the ground and to assess successes of this partnership through more than one underlying motivation, or singular rationale. Hawai‘i’s story of watershed planning and management is unique, based on its history (a rapid land tenure shift in the mid-19th century that prompted fragmented and imbalanced land ownership patterns), its spatial setting (steep and inaccessible geographical topographies), and its governance structure (multiple layers of governance often competing with one another for the same resources). These unique attributes (explored in greater detail in the following sections) add to the complexity and the struggle to plan for and manage the State’s water resources, moreover they make watershed governance in Hawai‘i distinctive from other areas in the United States (see Figure 1-1).

Figure 1-1: Complexity of Hawai'i's Watershed Governance



Source: Author.

1.2.1 History of Uneven Land Ownership

Land ownership in Hawai‘i is imbalanced, with more than 20% of all lands in the state owned by ten private landowners. This imbalance stems from a rapid land tenure change that transpired during the middle of the nineteenth century and led to an evident divide in Hawai‘i's land ownership (see Section 5.1). The story of the land tenure change in Hawai‘i was born of what has been called a "quiet revolution" (Kame'eleihiwa, 1992), and took place in less than half a century across Hawaiian Islands. Hawai‘i shifted from a traditional system of land tenure, where no particular occupants had outright ownership of the land they inhabited, to a system where land and its ownership was suddenly privatized. Hawai‘i experienced this transformation from a regulated communal land management system to a tenure system instituting property rights and promoting market-based sustenance, in less than 30 years. These events rendered the great majority of Native Hawaiians landless and made it increasingly difficult for them to practice traditional ways of life.

Many of the decisions and laws enacted going back as far as 1839 have affected traditional Hawaiian lifestyles. It is clear that the division of lands that had never been owned outright (māhele) [2] may have been disorienting for the Native population, as their relationships to the land was re-defined virtually overnight. Native Hawaiians, who had been physically and culturally anchored to the land, were profoundly affected by these changes. According to McGregor (McGregor, 1996), land is not traditionally a commodity to the Hawaiian people, but rather "it is the foundation of their cultural and spiritual identity as Hawaiians. They proudly trace their lineage to the lands in the region as being originally settled by their ancestors. The land is a part of their 'ohana and they care for it as they do the other living members of their families" (McGregor, 1996, p.16). The result of this shift in land tenure left a majority of Hawaiians without titles, deeds, or other forms of legal documentation that would establish the ownership of the lands they had previously inhabited.

This change in land tenure affected the Hawaiian environment far beyond creating a "landless" Native population. The events that have unfolded since the mid-nineteenth century in the Hawaiian Islands have threatened the way in which traditional knowledge is passed down inter-generationally: "Traditionally, cultural knowledge was remembered and passed down through oral tradition in chants, legends, myths, genealogies, and place names" (McGregor, 1996, p. 23). Along with this quickly emerging new way of life, which left increasing numbers of Hawaiian people landless, there was a profound impact on the ability of Hawaiians to transmit traditional knowledge between generations. Levy, in Native Hawaiian Land Rights (1975), attempts to summarize this situation, in referring to the 50 years immediately following the māhele:

> With a permanent population of fewer than two thousand, Westerners took over most of Hawai'i's land in the next half century and manipulated the economy for their own profit. They had already stripped the land of its only readily exploitable resource, sandalwood. After the Reciprocity Treaty of 1876, which allowed Hawaiian sugar to enter the United States duty-free, Western-owned sugar plantations dominated the Hawaiian economy. That the local population did not participate in this economy proved no obstacle; laborers

[2] The māhele was a land reform under the Hawaiian Kingdom, in 1848.

> were imported from the orient and Europe. By the turn of the century Hawaiians were a minority in their own homelands. (Levy, 1975, p. 858)

Very few Hawaiian communities have managed to remain entirely able to practice traditional Hawaiian customs and practices based on the principles of ‘ohana (family), respect for Hawai‘i’s natural resources, taking only what is needed (mālama ‘aina), sharing with neighbors (ho'okipa), and how changes in seasons make for differences in the wealth and availability of the resources produced. This knowledge continues to be passed down from generation to generation, through the stories of the elder, or kūpuna. There are many lessons to be learned from traditional Native Hawaiian Natural and Cultural resources management practices, and reconstructing the cultural history of a community is a very important way to plan for its future resources management. This is discussed in greater detail in Section 5.2 of this research.

1.2.2 Challenging Spatial Setting

Hawai‘i’s geography and geology contributes to the complexity of what is required to govern environmental resources such as water. Hawai‘i’s high volcanic mountain ranges receive the majority of water through a prevailing rainfall pattern driven by trade winds (winds from the north that move across the archipelago in a southwesterly direction), that release moisture as they ascend and gather at the top of these steep slopes. Subsequently, the greatest amount of rainfall occurs on the windward (north and east facing) sides of the Hawaiian Islands. This occurs as the winds warm and rainfall ensues and proceeds down the high mountains and dissipates over the leeward (west and south) sides of the islands, resulting in a semi-arid climate over those leeward areas (Derrickson, Robotham, Olive, & Evensen, 2002), a condition referred to as rain-shadow. The interaction between the islands’ geography and the prevailing wind patterns produce sizable variations in rainfall patterns and volumes from very limited annual rainfall on the leeward coasts to much higher volumes in windward mountain areas (Giambelluca et al., 2012).

Furthermore, since the Hawaiian Islands are relatively small in comparison to other watershed areas in the U.S mainland, they are also may be characterized as prone to flash flooding and rapid drainage. The majority of Hawai‘i’s streams are essentially rain-fed. They originate in the high elevation mountain ranges and eventually empty into the ocean. Unlike larger continental United States watersheds, which may encompass large expanses of land, Hawai‘i’s watersheds are relatively narrow. There are also very few perennial streams in the Hawaiian Islands (Derrickson et al., 2002). The Hawaiian environment is rugged, and management activities in Hawai‘i’s upper watersheds can be extremely challenging and often requires access to helicopter transport.

1.2.3 Governance Structure

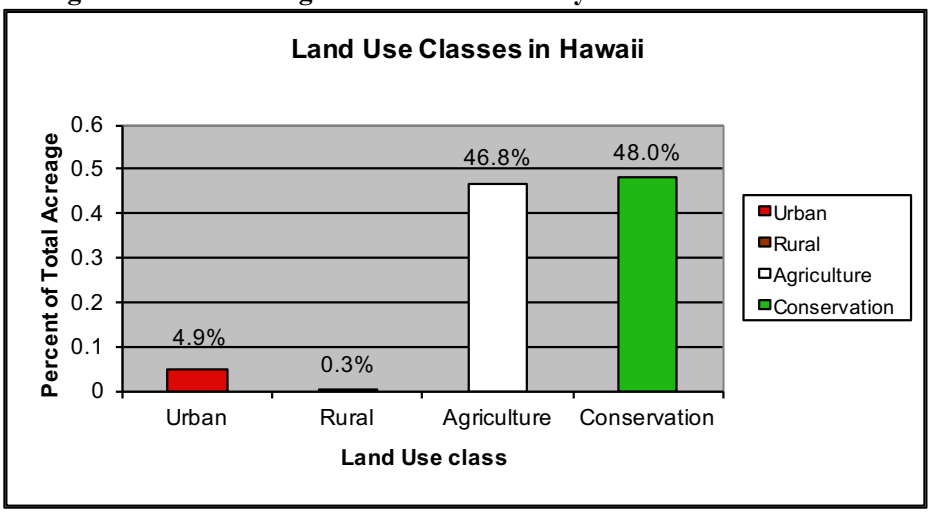
There are multiple layers of administration and governance that complicate management activities across Hawai‘i’s watersheds. Stream systems may span many acres of land (water is not a fixed resource), its management similarly spans across multiple layers of county, state, and federal jurisdictions, as well as private owner parcel boundaries. This can lead to issues with coordination, as well as further need to harmonize goals between players who might not otherwise ever have to interact.

1.2.3.1 State Land Use Classification

Hawai‘i’s State Land Use Classification was established in 1961, with a goal of preserving and protecting Hawai‘i’s lands and encouraging uses to which lands are best suited. Hawai‘i’s Land Use Law was the first of its kind in the country, and is overseen by the State Land Use Commission. The majority of Hawai‘i’s lands fall within the Conservation (48%) and Agricultural (46.8%) Land Use Classes. A little more than 200,000 acres of the State’s 4.1 million acres fall within the Urban Land Class (4.9%), and the final part within the Rural Class (0.3%). Most of the Conservation lands are located either near the state’s high mountain areas (largely inaccessible), or near the shoreline, to protect ocean resources. Agricultural lands are mostly located in the mid-level plains of the islands, to facilitate cultivation or the raising of livestock. Many of the agricultural lands consist of large parcels used for the cultivation of crops, aquaculture, raising livestock, wind energy facilities, timber cultivation, agriculture-support activities etc. Most agricultural

classified lands are owned or leased from the state by private owners. Management activities to protect Hawai‘i s watershed mostly occurs on Conservation lands. Many state DLNR divisions conduct activities within these areas, including its Office of Conservation and Coastal Lands (OCCL) and its Division of Forestry and Wildlife.

Figure 1-2: Percentage of Hawai‘i Lands by Land Use Classification



Land Use Class	Total Acres
Urban	200,438
Rural	11,602
Agriculture	1,926,502
Conservation	1,973,846
Total	**4,112,388**

Source: State of Hawai‘i. Office of Planning. 2015. http://hawaii.gov/dbedt/op/land_use.htm
Notes: Island of O‘ahu has no Rural Land Use class.

1.2.3.2 County Zoning

Adding another layer of governance or oversight, the City and County of Honolulu Department of Planning and Permitting, the County of Hawai‘i, the County of Maui (which includes Moloka‘i and Lāna‘i as well), and the County of Kaua‘i Planning Departments control land uses in the Rural and Urban Land Use Classes (there is no rural zone on O‘ahu but there are rural zones on each of the other islands). County zoning seeks to regulate and restrict the heights and sizes of buildings; percentages of a building site that may be occupied; off-street parking; setbacks; size of yards, courts, and other open spaces; density of population; and the location and use of buildings, structures, etc. While urban land uses are all located largely

downstream from upper watershed managed areas, most delivery and consumption of water across the Hawaiian Islands occurs within the urban zoned lands. The counties, including their boards of water supply, are key players and have a stake in collaborating with other entities to ensure satisfactory watershed management.

1.2.3.3 State Reserves and Other Public Mandates

Forest Reserves, Natural Area Reserves (NAR), and Watershed Partnership areas parse the upper elevation landscape of the Hawaiian Islands. Forest Reserves are managed under the State's DLNR/DOFAW's Forestry Program, the NAR are administered under DLNR/DOFAW's Native Ecosystems Protection & Management Division, as is the Watershed Partnership Program. While all have similar objectives, geared towards a common goal to protect watersheds and native ecosystems, these programs at times have competing public mandates. For example, DLNR/DOFAW is responsible for the management of State-owned forests, natural areas, public hunting areas, and plant and wildlife sanctuaries. Although DOFAW is tasked with watershed protection and native resources protection, it also oversees outdoor recreational activities such as hunting for which it issues permits. Ironically, the agency's imperatives simultaneously mandate both the eradication and provisioning of ungulates as it needs to provide enough opportunities for hunters (maintaining stocks of deer, pigs and goats), while still protecting native habitats from the impacts of ungulate game animals roaming the upper watershed areas uncontrolled (see Section 5.2 for more detail).

1.2.3.4 Watershed Partnerships

It is within this socio-cultural backdrop, challenging spatial setting, and among these various stakeholders that Hawai'i's watershed partnerships operate -- i.e., among layers of often conflicting interests and priorities. Hawai'i's Watershed Partnerships (WP) conduct management activities in the most remote, high elevation areas of five islands in the State. They consist of ten individual partnerships, each having unique management needs and members from various sectors, but operating under a statewide association which was established in 2003: The Hawai'i' Association of Watershed Partnerships (HAWP). This research will

use the HAWP for its case study, as HAWP represents a great example of a CNRM group, and an organization for which a comprehensive evaluation has yet to be conducted.

1.3 Rationale

Studies on collaborative watershed management and collaborative natural resources management (CNRM) groups are not new; in fact, research on community participation in watershed partnerships has been conducted in Brazil and Canada (Perkins, 2011), in Central Africa (German & Taye, 2008), as well as in the United States (Koontz and Johnson 2004; Leach, Pelkey, and Sabatier 2002; Leslie A. Duram 1999; Sabatier 2005). However, a thorough empirical study of watershed partnerships in Hawai‘i has not yet been completed. One 2005 study (Gutrich et al., 2005) reported the findings of an international workshop convened in Hawai‘i to explore the strengths of approaches used to assess stakeholder values of environmental resources and potentially foster consensus in the public forums and processes of ecosystem management. That paper sought to shed light into the ways scientists could effectively build consensus and augment the process of co-operative ecosystem management. While making reference to a Hawai‘i group, the study drew upon field experience in projects throughout Hawai‘i, Southeast Asia, Africa and the U.S. mainland to derive a set of lessons learned that could be applied both to Hawai‘i and all other watershed partnerships, with no direct consulting, interviews, or surveys administered to draw lessons specifically from the Hawaiian case sample.

Hawai‘i’s watershed partnerships are unique and have been under-studied. This opportunity to study a CNRM group in Hawai‘i may lead to some new, significant and useful findings in scholarly research in planning, specifically in CNRM, as well as evaluation research.

1.4 Dissertation Structure

This dissertation begins with a review of the existing literature on collaborative planning, focusing on collaborative natural resource management (CNRM); identifying how past research has weighed in upon planning for resource management from equity, democratic, ecological integrity, and efficiency

perspectives (Chapter 2:). Particularly, this chapter reviews the multiple frameworks that have been advanced to suggest ideal situations under which CNRM institutions might thrive. It also identifies gaps, in the pre-existing research that this study seeks to contribute to and potentially buttress. Chapter 3: conceptualizes the research that was undertaken for this dissertation, including the articulation of this research's five main propositions, and research questions. Chapter 3 also explains common features among stakeholder partnerships, and how alternate rationales may stimulate participation.

The methods utilized to conduct this research are described in Chapter 4:. The mixed methods used in this study have consisted of stakeholder interviews; archival research; administration of an organizational structured questionnaire to Partnership management; as well as an evaluation plan based on four theories of change (theorizing how the program's activities might lead broader outcomes and impacts). Evaluative questions under four rationales are outlined in this chapter, as well as indicators by which the success of Hawai‘i's watershed partnerships will be measured.

Chapter 5: sets forth the background for this research, including the history of conservation land management in Hawai‘i (from pre-European contact to today), as well as the creation of the Hawai‘i Association of Watershed Partnerships (HAWP), and each of its ten partnerships on five Hawaiian Islands. The Chapter also reviews a number of public consultation mechanisms that are either mandated or voluntarily implemented in Hawai‘i to promote greater representation in management activities.

The analysis for this research is found in Chapter 6:. Findings specific to each rationale for working in collaboration is assessed, by indicators (indicators defined in Chapter 4). A summary assessment for each rationale is also presented in this Chapter. The final chapter (Chapter 7:) outlines conclusions and more expansively identifies specific recommendations for a) Hawai‘i's State Watershed Partnership Program; b) planning practitioners and evaluators; c) this study's limitations, and further research.

CHAPTER 2: COLLABORATION AND RESOURCES MANAGEMENT

Across the United States, public, private, and non-profit policy-makers and managers have increasingly been working in collaboration to consolidate the pool of tools, knowledge, and resources to address existing and emerging environmental problems more efficiently (Agrawal & Ribot, 1999). Collaborative Natural Resource Management (CNRM) has been promoted as a way to more efficiently manage resources, increase competency, and advance well-rounded governance approaches for large-scale environmental issues such as the management of water, forestry, and fisheries. Partnership agreements have increasingly surfaced to address these shortcomings. These agreements have typically involved multiple stakeholders from varied institutions from the private, public and non-profit sectors working together to address broad issues a single institution may be ill equipped to handle on its own accord.

Evaluating the degree to which a CNRM efforts have been successful can present unique challenges. As working collaboratively increases the number of stakeholders involved, the complexity of promoting multi-stakeholder approaches in NRM also increases the complexity of how to assess their accomplishments. Furthermore, while we continue to promote of CNRM as a preferable alternative to top-down, centralized planning, there is still little evidence that collaborative processes actually improve environmental outcomes (Koontz & Thomas, 2006, p. 111). As collaborative arrangements increasingly develop, interest in how to effectively evaluate them has also increased. As these multi-stakeholder efforts reflect diverse views and values, evaluation approaches should also consider the underlying rationale for participating in these new types of arrangements:

> While interest in evaluating collaborative conservation efforts is widespread, motivations for evaluation vary. Participants in collaborative efforts want evaluations that can help improve their efforts and meet their personal goals. Facilitators and resource managers are looking for guidelines that help identify which approaches are appropriate in different circumstances. Policymakers want informed evaluations that help them formulate

> appropriate rules and regulations. Funders and interest groups need to determine which collaborative efforts to support and what stance to take on general policies promoting or inhibiting collaborative processes. Advocates want proof of their success (Innes 1999), while critics want to demonstrate that their concerns are well founded (e.g., Coglianese 1999). Academics are interested in exploring how collaborative resource management affects society, and in testing theoretical models on specific examples. (Conley & Moote, 2003, p. 373)

This chapter situates this research as part of an ongoing discourse focused on the potential benefits and challenges associated with working in collaboration to manage natural resources. It begins with a broad overview of collaborative planning, and then reviews the literature pertaining to collaborative environmental governance, and the underlying motivations often utilized to champion collaborative governance efforts. The chapter will highlight the prominent frameworks that have been promoted as being integral to promote enduring NRM collaborations. It will then conclude with a summary of how many of these frameworks have been employed in evaluation to illustrate how process indicators have been predominantly used to measure the success of CNRM efforts in lieu of actual environmental outcomes criteria.

2.1 Collaborative Planning

Planning in collaboration with communities, or groups extends far beyond simply involving participants in a given process. The collaborative planning effort suggests that providing information through consultation will ultimately lead to knowledge production and concomitant contributions to decision-making undertaken by a variety of stakeholders (Healy, 1997). This implies that the involvement of local residents in partnerships, as part of a collaborative process, should enable participants to express opinions about policies which could potentially affect them; and that this could ultimately lead to improvements in the quality of decision-making in their communities. Within this framework it would appear that the quality and access to services and resources within their communities would be enhanced by engaging the community in

management decisions. This process can lead to engaging (or re-engaging) local people with local democratic processes and renew civic society and that by sharing power and knowledge with residents, they will be further empowered to manage their assets or services for themselves (Bailey, 2010). This consideration, however, assumes that the people being engaged (or re-engaged) actually have assets, which is often not always the case in small communities that are socio-economically disadvantaged.

Some critics of collaborative planning argue that as the rational model of planning was critiqued for not necessarily leading to the intended outcomes outlined in plans, collaborative planning practice also grapples with its own implementation gap (see Nigel Taylor, 1998). Collaborative planning has also been critiqued for being too concerned with promoting doing what is "right" by a community, and how a fair process will lead to fair outcomes:

> The collaborative approach attempts on the one hand to admit alternative methods of knowing and reasoning and to be able to accommodate different cultural standpoints within spatial planning processes. The counterpoint is that in refraining from stipulating elements of the process or of stating desired outcomes (leaving such issues to be determined by participants), the collaborative approach risks enabling narrow instrumental and utilitarian forms to continue to predominate (Harris, 2002, p.36).

What these critics suggest is that the process occurs without focus. While the collaborative process is dynamic and flexible, it is diligently implemented such that opinions, values, goals, objectives and outcomes are in fact typically achieved. The process itself, when skillfully guided, leads to outcomes that are not pre-determined, but rarely lead nowhere (Harris, 2002).

2.2 Environmental Governance

Environmental governance, or "the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes" (Lemos and Agrawal 2006, p. 298) differs from government control over the management or governance over natural resources. Governance occurs across various sectors, private, non-governmental and government, as well as combinations of these.

Namely, "When governance and government are used interchangeably, it can lead to policy issues being defined implicitly as a problem of government, and that the "government" should hence fix it" (Graham, Amos, & Plumptre, 2003, p. 1). In recent years, the private sector has increasingly been suggested as being more effective at managing actions and outcomes than the public sector with regard to environmental management. This pushback claims the public sector, or state, has largely become delegitimized; and increasingly seen as inefficient, clumsy, and overly bureaucratic (Peters & Pierre, 1998). Non-profit organizations (NGOs), as well as various grassroots community groups are also becoming important players in the governance of natural resources. Grassroots organizations also have taken an inclusive, or pluralistic approach to environmental management grounded in local participation (Weber, 2000). In fact we are progressively witnessing a shift toward multi-actor approaches to environmental governance, and the inclusion of government and non-government actors playing vital roles in them, including stakeholders from the private sector and civil society in environmental governance systems (Lockwood et al. 2010; Bäckstrand 2006).

As dilemmas and solutions focused on the environment increase in complexity, as well as diversity such that no single actor has the resources or knowledge to respond efficiently, we are simultaneously experiencing unpredictability in global systems, as witnessed in major events such as anthropogenic climate change (Lockwood et al., 2010). Additionally, widespread shifts in power and authority from national to supra-national scales (globalization) (Pierre 2000); as well as and perhaps related to, a simultaneous (and often contradictory) "tendency towards 'integration, centralization, and globalization on one hand — and disintegration, decentralization and localization on the other" (Rosenau 2000, p. 177 in Lockwood et al., 2010, p. 988). The climate in which we are experiencing these changes has prompted the need for new management structures, social configurations, and arrangements as we now better understand that ecological concerns can't be addressed in the public or private sectors alone, or exclusively, within community groups, or NGO's on their own. It is becoming more and more evident that many environmental

problems are no longer exclusively associated with a finite resources base but instead attributed to prevalent or probable governance failure (Pahl-Wostl, 2009).

Essentially, it has been argued that we are seeing more "hybrid", "plurilateral", "multi-sector", or "complex" modes of representation because of a broader need to counter, or address persisting governance, democratic and implementation deficits in civil society, particularly with regard to sustainable development (Bäckstrand, 2006). The "democratic" deficit, referring to how a solution may be arrived at in a fair way, does not necessarily make it just; also implicated is the implementation deficit, mainly because of the scope and size of environmental problems. Due to the governance of the environment being a collective action problem essentially involving and affecting diverse stakeholders, it is believed that multi-stakeholder involvement in its management will lead to improvements in environmental actions and outcomes. The decentralization of environmental governance models has been advanced to produce more just and equitable outcomes by allowing for broader input in the decision-making process and potentially benefiting from persons with more sensitivity and intimacy to local priorities and also possess access and utility of local knowledge, and local agency in plan implementation and management methods.

While some of the benefits of segmenting environmental governance or fragmentation of governance (Biermann et al. 2009) have been supported, there is a lack of consensus on consequences of fragmentation of governance. According to some researchers, we still lack a conceptual framework for a comparative study of different types governance architectures (Biermann et al. 2009). Despite the growth of these new hybrid modes of governance over the last three to four decades, the devolving of environmental governance may still be weak and perhaps unable to provide effective solutions to managing environmental resources and monitoring environmental outcomes (Bäckstrand (2006). According to some researchers, "Optimists have claimed that de-centralized multi-sector governance arrangements are better suited to deal with complex environmental problems than hierarchical processes of governmental steering" and that "the conventional wisdom underpinning most multi-stakeholder initiatives is that bottom-up participation forms

the basis for stronger environmental policies and more effective environmental institutions" (Lövbrand, Rindefjäll, & Nordqvist, 2009, p. 78). There currently exists, however, inadequate research to support this proposition.

2.2.1 Collaborative Planning and Equity

As described above, environmental governance has shifted from a historically dominant resource management paradigm emphasizing centralized, top-down management (see Brown & Harris, 1992; Colby, 1991) to a model that promotes group decision making that accommodates diverse views and shared learning (Armitage et al., 2008) striving for more just, equitable processes and outcomes. Negotiating the complexities of this new collaborative model, however, requires developing new capacity to deal with multiple objectives (Berkes, 2007) as this shift may simply "reinforce existing power disparities rather than promote diverse stakeholder inclusion" (Koontz & Thomas, 2006, p. 113).

Planning research that a multiplicity of voices engaging in the discourse and inclusive dialogue has supported the idea that involving actors across various institutional sectors can lead to greater equity and inclusiveness in decision-making, and facilitate a broader consensus (see Innes & Booher, 1999; Healy, 1997; Susskind & Cruikshank, 1987). Much of this literature has focused on recognizing that local knowledge (knowledge not publicly disseminated) as well as meaningful input from community members are viewed as crucial components to promote equity in governance decisions.

While an inclusionary collaborative process does not necessarily *guarantee* a just process, or equitable outcomes, Healey suggests that it would be only "ethically proper for any planner or policy analyst trained to assess the impacts of interventions on people and places through time to take as inclusionary a view as possible of the range and distribution of impacts" (Healey, 2003 p.115). The collaborative planning exercise hence necessitates the involvement of a complete range of stakeholders, that may be defined as persons with legitimate concerns about a place, without making assumptions about how they might communicate

those concerns (Bryson & Crosby, 1992; Kumar & Paddison, 2000) as these individuals, groups and organizations all have a vested interest and influence on a particular project, or given area (Kumar & Paddison, 2000). The right to participate can positively or negatively influence the course of group processes in relation to the various values and points of views being brought to the table. However, to facilitate greater community involvement in the decision-making process, opportunities to participate alone are insufficient, as opportunities to exert some level of influence, or 'power' in the decision-making process and resulting actions that will actually impact stakeholders requires more than representation alone (Lockwood, Davidson, Curtis, Stratford, & Griffith, 2010).

2.2.1.1 Inclusion versus Representation

The significance of representation and inclusiveness in collaborative governance has been relatively well documented. For example, as presented in Ansell & Gash (2008, p.546), some argue that collaborations should include representation by key interest groups (see Smith, 1998). Other scholars, such as Connick and Innes (2003) define collaborative governance as including representatives of all relevant interests, while some have described collaborative efforts as a type of problem solving that involves the shared pursuit of both government agencies and concerned citizens (see Reilly, 1998). The terms *representation* and *inclusiveness* have, however, liberally been used interchangeably throughout the literature. I contend that unlike representation, inclusiveness is not simply about "bringing everyone to the table". While enhancing participatory practices enriches the input received, "enhancing inclusive practices builds the capacity of the community to implement the decisions and tackle related issues" (Quick and Feldman, 2011, p. 274). Inclusiveness is oriented toward providing opportunities for all stakeholders to participate and also have the opportunity to influence decision-making (whether it be influence in the process, activities, or outcomes) (Lockwood et al., 2010). Inclusion is viewed as a dynamic process and generally oriented to establishing connections among people, across issues, and over time (Quick and Feldman, 2011).

A study of 76 watershed partnerships in Oregon and California attempted to provide a framework for

assessing the democratic merits of collaborative public management in terms of seven normative ideals: inclusiveness; representativeness; impartiality; transparency; deliberativeness; lawfulness; and empowerment (Leach, 2006). Conclusions from this study suggested that the while representation may be generally balanced, the exclusionary nature of some partnerships and the absence of critical stakeholders cannot be overlooked. The author suggested that "Inclusiveness is one of the simplest principles to evaluate for a given collaborative process" (Leach, 2006, p. 101). He used provocative questions to support his claims but in my opinion failed to actually measure inclusiveness. The author's assessment for inclusiveness included whether or not (1) the process had rules (official or tacit) governing who may participate, or whether participation was open to all; (2) whether anyone who wished to participate was turned away; (3) and whether excluded participants were invited to participating in electing representatives. Analysis of these three indicators, reveal that only the last condition can be measured by examining the dynamic output (yet this approach was not pursued). Measuring levels of inclusiveness requires impacting decisions that have ensued from electing a representative, not simply participating in the election of a representative.

2.2.1.2 Indigenous Planning and Collaboration

Collaborative governance models have also been promoted with aspirations of increasing equity for indigenous communities that have historically been marginalized in relation to management efforts within their communities. Indigenous peoples have been embedded for centuries upon ancestral lands which has provided intimate knowledge of local customs, practices, and ecological processes. Any attempt at understanding traditional NRM requires an familiarity with notions of *placeness*, or the relationships and connectivity between humans and the environments they inhabit: "Sense of place recognizes that places are social constructions insofar as their meanings are created and reproduced through interpersonal interaction, formalized in social behavior, and ultimately persist in collective memory" (Stokowski, 2002, p. 372 in Glover, Stewart, & Gladdys, 2008, p. 387). It is evident in most indigenous populations that intimate relationships with land and seascapes are encoded into social structures that generate the spiritual and political ecologies they inhabit. Place-based management in traditional terms focuses on a body of

accumulated knowledge of place and norms. Social scientists and policy makers can greatly benefit by acknowledging this deep connection, and body of knowledge.

It would be a mistake to assume that traditional methods of ecological management lack shortcomings and/or limitations and are without flaws. In actuality, not all traditional practices have been found to be ecologically beneficial (see Redford and Stearman 1993; Diamond 1999 for example). Equally important is the necessity to recognize that it may be difficult for modern managers to identify with traditional knowledge systems, or to construct generalizations from them, to be replicable and applicable in cross platform arenas and circumstances. However, "Many small-scale, traditional societies in which the role of the state is minimal, or even non-existent, succeed in establishing and implementing systems of rights and rules that govern the behavior of their individual member in such a way as to avoid severe depletions of living resources over long time periods and to produce outcomes that are generally seen as both legitimate and fair" (Ostrom 1990; Ostrom 2002 in Delmas and Young 2009, p. 26). The extent to which we can successfully scale-up findings to apply to larger societies (at a global level); ease access to data; and contend with issues interpretation (Berkes, Colding, & Folke, 2000) also plague modern-traditional understanding of how to best integrate these two distinct systems of knowledge.

Research on the infusion of traditional knowledge into integrated NRM frameworks has also gained momentum in recent years. Some studies on Traditional Ecological Knowledge (TEK) have explicitly explored how indigenous communities have historically used and contemporarily utilize TEK to respond to complex system processes and functions. According to Berkes, TEK is a knowledge-practice-belief concept (Berkes, 1999), which can be viewed as a "library of information on how to cope with dynamic change in complex systems" (Berkes et al., 2000, p. 1259). Because TEK is a "cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with

their environment" (Berkes et al., 2000, p. 1252), harmonizing TEK and modern approaches of management have been suggested as necessary ways to successfully manage resources.

In Hawai'i', major differences between what has been described as traditional land management and what has transpired since the advent of European contact include variances in: scope of authority; access rights; stewardship; enforcement; management focus; management history; knowledge base; primary tools used; and management targets (Jokiel, Rodgers, Walsh, Polhemus, & Wilhelm, 2011). Authority of management essentially underwent a from a centralized to a devolved style of governance as access rights became more decentralized and open. Generally, stewardship, which was traditionally conducted by one district manager that was appointed by an ali'i (chief) also devolved after kingdom rule. The focus and theories oriented at land management locally developed over generations was established by need versus sustainable yield. Western land management approaches are science-based and include a number of motivations, including recreational, commercial and environmental protection. In traditional frameworks, the dissemination of the knowledge base transmitted orally through family lineage in traditional times, and through objective records, measurements and observations post western contact. Tools and targets for managing resources included restrictions on consumption and acquisition that were regulated through a matrix of indigenous structures of religiosity ('aikapu) and law (kānāwai). Western management does include restrictions on tool use, as well as controlling periods of harvesting, with less of a focus on intermittent use. Finally, because the knowledge about resources was often believed to belong to the people of a specific area, continual monitoring was common when compared to contemporary practices. (Jokiel et al., 2011).

To apply traditional approaches in land management today, requires an understanding that the engagement of communities in natural resources management is based on the logic that local people are believed to be more knowledgeable than experts in many instances at managing their local resources because of their unique connection to place (Fortmann, Roe, & van Eeten, 2001). This strategy will require the promotion of site specific strategies, best management tools and practices, and further understanding of the most

efficient modes of management to facilitate or improve co-management across different levels of governance (including public and private sector actors as well as community stakeholders). Berkes suggests a range of strategies that can serve as directives for developing appropriate ways to work with multiple stakeholders while incorporating the values, ethics and knowledge of local actors (Berkes, 2009, see table below). These strategies are largely pluralistic, based on co-management arrangements which involve vertical linkages, that are linked across multiple levels of organization and parallel horizontal linkages among actors that are situated in the same level of organization (Berkes, 2009). In order for local voices to be included in multi-actor agreements to manage local resources, demands a clear understanding of not only the cultural context within which the collaborative effort operates, but also acknowledges the value of the potential knowledge base upon which policy and practice could draw from.

Table 2-1: Strategies That Have Been Used to Facilitate or improve Co-Management

Strategies	Reference
Bridging knowledge: Incorporating multiple knowledge systems and multiple scales enhances environmental decision-making. The potential in partnerships can be captured by combining complementary knowledge, skills and capacities of different actors at different levels of organization.	Eamer, 2006; Reid et al., 2006; Berkes, 2008
Co-production of knowledge: The process of knowing is dynamic, and relies on observation, validation and adaptation to changing circumstances. Researchers/scientists working with place-based learning communities can co-produce locally relevant knowledge that neither party can produce alone.	Davidson-Hunt and O'Flaherty, 2007; Berkes, 2008
Cooperation building tactics: especially in weak institutional settings, can include (1) continuous physical presence, (2) regular contact with people close to decision-makers, (3) maintenance of multiple programs for different groups, and (4) hyper flexibility in resource allocation and schedules.	Wollenberg et al., 2007; CIFOR, 2008
Participatory research: Research that includes rural and indigenous communities as equal partners has the potential to build social capital and enhance local capacity for problem solving. The inclusion of local perspectives fosters the ability to design locally appropriate resource management strategies.	Arnold and Fernandez-Gimenez, 2007
Collaborative monitoring: It is difficult to know a priori what to monitor, and local partners can help decide what is to be monitored and how. Monitoring that includes, where possible, local ways of reading environmental signs and signals have the potential to widen the range of information available.	Kofinas, 2002; Mutimukuru et al., 2006
Participatory scenario-building: Scenarios will be more informative and useful if they can incorporate multiple perspectives. Scenario building that includes joint deliberation about what is known and what is not known provides an ideal space about questioning assumptions made by different disciplines and different perspectives.	Bennett and Zurek, 2006; Kok et al., 2007
Fair/democratic distribution of power: Newly devolved power as a result of co-management arrangements, and decentralization in general, tends to be captured by the local elite. Hence the policy challenge is not decentralization per se but to make it work through various measures to foster fair distribution of power.	Be´ne´ and Neiland, 2004, 2006
Downward accountability: Co-management is often successful in setting up upward accountability mechanisms (e.g., co-management agency's responsibility to the Minister). However, setting of effective downward accountability mechanisms is also important: agency's responsibility to the user groups.	Be´ne´ and Neiland, 2004, 2006

Source: Berkes, 2009.

Based on work from Berkes (2009), Table 2-1 above identifies strategies reported to facilitate or improve co-management throughout a great body of research. These strategies aid in the promotion of better understanding and engagement between resources managers, and other groups working in collaboration with local communities. Alternative studies focus on factors that lead to the success of these arrangements (to be covered in the following sections). At its core, " the basic idea behind co-management is that people whose livelihoods are affected by management decisions should have a say in how those decisions are made" (Berkes, 2009, p. 1692). For the management of common pool resources, this can certainly be most challenging, as the activities and decisions ultimately impact all members of society.

2.2.2 Collaborative Governance and Efficiency

Condemnation of processes of industrial capitalism have served as another foundational paradigm upon which collaborative governance has been advanced. According to Healey, "The tradition of economic planning is a vivid expression of the materialist and rationalist conception of a planned social order" (1997, p.10). She explains that "The processes of production and distribution had to be planned to ensure efficient production and continuing growth, and, for some protagonists of economic planning, a fair distribution of the benefits of growth" (Healy, 1997, p. 10). Planning efforts and research sought a departure from state controlled economic planning to more emphasis on collective management, or bottom-up planning that seeks to integrate urban, rural, economic and social dimensions of life (Healey, 1997).

Collaborative governance, or "partnering up" has also been endorsed in order to increase the efficiency of public service delivery. Increasingly, a number of legislative measures have mandated public-private partnerships as a way to make this delivery more efficient reaching out to the private sector which is regarded (not always unanimously) as possessing a number of resources that may benefit public service delivery. A number of benefits have been identified to make reaching out to the private community to collaborate for better service delivery, including environmental management. These include: local governments' access to funds for capital investment; access to scaled economies; access to managerial,

technical, or professional expertise; exposure to more flexible service provision; and shared risk (which can be at the same time a benefit or just that, a risk…). Bloomfield (2006) also claims that through ‘‘innovative, long term public-private partnerships ... local governments can save money by applying private sector discipline to the delivery of public services” (p. 400). Focusing on learning from private sector techniques (such as market-driven competition and performance contracting) partnerships have been hailed as more efficient by helping local governments save money and applying those same techniques to the delivery of public services and construction (Johnson, McCormally, and Moore 2002 , 1; NCPPP 2002; Seader 1994 , 78; Utt 2001 , 2; Williams 2003 in Bloomfield, 2006).

Bloomfield (2006) has, however, challenged the benefits of long term public-private partnerships, pointing to how in practice, they in fact can lead to local government efforts to capture desired benefits being undermined, claiming that in reality, shared risk, market-driven competition, and transparency actually have proven elusive. In “Partnership Synergy: A Practical Framework for Studying and Strengthening the Collaborative Advantage”, Lasker, Weiss and Miller (2001) examine whether partnerships can in fact “enable different people and organizations to support each other by leveraging, combining, and capitalizing on their complementary strengths and capabilities” (p. 180). The research does indicate that operating in this manner can lead to great frustration as these types of collaborations are new, and often require, “relationships, procedures, and structures that are quite different from the ways many people and organizations have worked in the past” (p.180), which may often be time consuming, resource intensive, and challenging to negotiate.

2.2.3 Collaborative Governance and Deliberative Democracy

Since the 1990s, the theory of democracy has largely been dominated by two main approaches: social choice theory and deliberative democracy (Dryzek & List, 2003) Social choice theorists suggests democracy is largely flawed in its consideration of aggregated views, interests or preferences of individuals without necessarily weighing the content of decisions actually being made. Democratic theory viewed by social

theorists has been critiqued heavily (see Arrow, 2012; Riker, 1982; Hardin, 1990) for not being representative of popular will, because of inevitable impossibility, instability and arbitrariness in aggregating people's choices. Today, "The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government" (Dryzek & List, 2003. p.1). Dryzek also explores a deliberative turn and renewed concern with the authenticity of democracy and in recent years focusing on "the degree to which democratic control is substantive rather than symbolic, and engaged by competent citizens" (Dryzek, 2000, p.1).

Some planning theorists (see Sager, 2001; Healey, 1992) assert that a "viable local democracy needs a continuing debate in the public realm about the themes that are of general interest to the community" (Sager, 2001, p. 199). Debating in the public realm entails not only access and representation, but also suggests fair outcomes might be from the process. Debate says little about justice, or equity however. There are scholars (see Bäckstrand, 2006 for example) that point out that "while deliberative democracy has been advocated as the most viable model for democratizing governance, questions of power, voice, representativeness and accountability of non-state actors remain central" (p. 494). Nonetheless, Leach (2006) inquired about stakeholder perceptions of the democratic character of collaborative processes in which they were participants. In that study, Leach defined seven indicators of good democracy (see Table 2-2). These indicators all focused on process, however, revealed very little about the actual outcomes of collaborative processes (once again operating through the assumption that a fair process will result in fair outcomes).

Table 2-2: Evaluating the Democratic Character of Collaborative Processes

Inclusiveness	An inclusive process places few formal restrictions on participation
Representativeness	A representative process ensures that the interests of all affected individuals are effectively advocated, either in person of though proxies
Impartiality	An impartial process treats all parties equally
Transparency	A transparent process governs itself through clear and public rules
Deliberativeness	A deliberative process allows participants to brainstorm, critically examine each other's arguments, identify common interests, and build a base of shared knowledge and social capital
Lawfulness	A lawful process upholds all existing statutes and regulations
Empowerment	An empowered process enables participants to influence policy outcomes

Source: Leach, W. D. (2006). Collaborative Public Management and Democracy: Evidence from Western Watershed Partnerships. Public Administration Review, 66, 100–110.

2.2.4 Collaborative Governance and Resource Conservation

The collaborative governance literature has debated the various outcomes that may determine the success of collaborative resource management. Some scholars have supported notions that social outcomes such as representativeness, or process driven outcomes are adequate evaluative criteria to assess group efforts (see Buckle & Thomas-Buckle, 1986) that support mediation and mediators as significant contributors to successful collaborative environmental outcomes, while others (see for example Kenney 1999; Snow; 1998; Coontz and Thomas, 2006) nevertheless contend that meaningful measures of success should ultimately be linked to improved environmental conditions (Conley & Moote, 2003). "Collaboration is not a panacea; it is a choice that policy makers and public managers should make based on evidence about expected outcomes. As we enter the era of the collaborative state, we must buttress the enthusiasm for collaboration with a better understanding of its environmental impacts" (Koontz & Thomas, 2006 p. 111).

While identifying environmental criteria that could be most illustrative of improved outcomes is not in itself a difficult task, it is the actual on-the-ground realization is much more complicated. Useful environmental criteria could include improved habitat; lands protected from development; improved water quality; changes in land management practices; biological biodiversity preserved; soil and water resources conserved (Conley and Moote, 2003). At this moment, "Methods exist for sampling a wide array of natural resources (See Goldsmith 1991; Spellerberg, 1991), but significant challenges exist in applying these methods to evaluating collaborative natural resource management" (Conley and Moote, 2003, p.380). Some of those challenges include difficulties associated with developing clear, measurable goals to assess progress; variability in ecological data and the necessary deep timescales required to assess changes over time (making assessing trends very difficult); and also making sure there are actual causal links between on-the-ground management activities and ecological improvements. While not entirely dismissing the benefits of assessing social outcomes, Koontz and Thomas (2006) and other scholars have suggested our understanding of the impacts of collaborative management on environmental outcomes is limited, and that

new research designs should be developed to link management outputs with long term environmental outcomes. Contemporarily, most environmental assessments consist of stakeholders' self-assessments of outputs through surveys and interviews, but rarely by systemic and/or trending tracking of environmental improvements in actual outcomes.

Environmental outcomes have been measured in various contexts: (1) as participants' perceptions of environmental improvement (though this approach is indirect and runs the risk of introducing bias in results collected due to halo effect or cognitive dissonance) ; (2) as changes in land cover (which can be done with imagery, or represented as percentages to be tracked over time); (3) as changes in ecological biodiversity; (4) as changes in environmental parameters (for example, improvements in water quality or contaminant discharge rates).

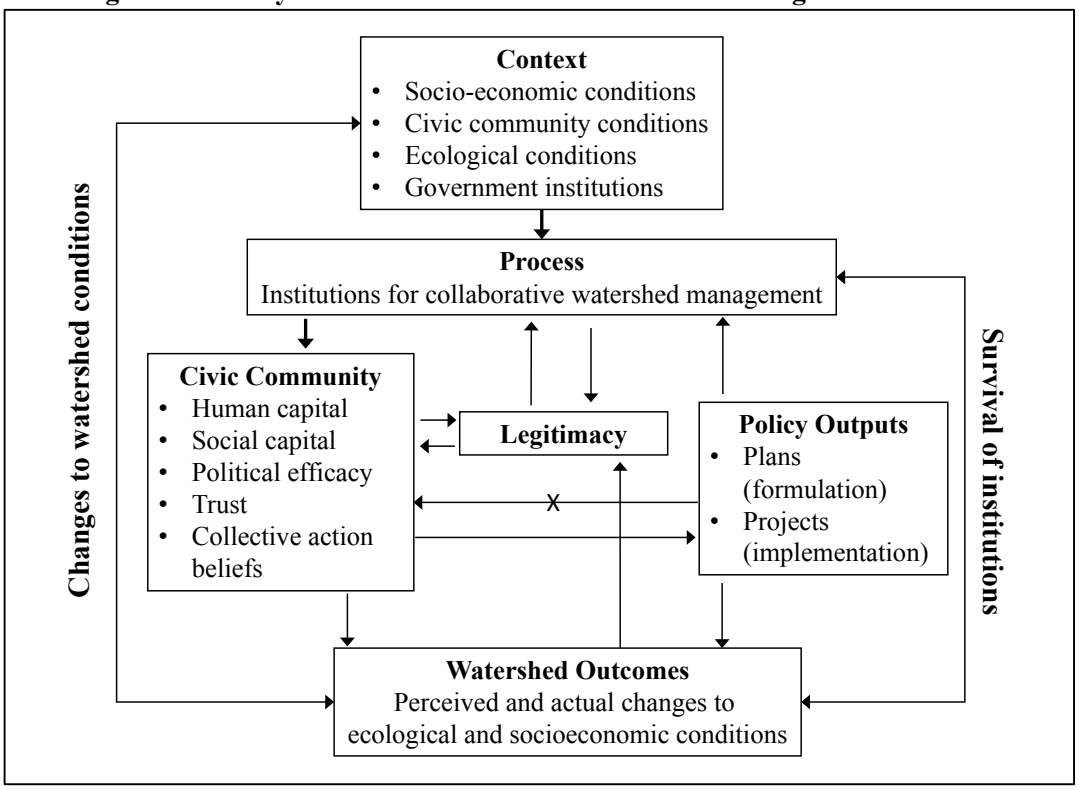
2.2.5 Watershed Management Model

Sabatier identifies sets of criticism of collaborative watershed management, which include issues with representation; building trust and civic community as well as the basic survival of these collaborations, suggesting collaborative groups have difficulties finding a niche in a landscape dominated by single-function agencies often reliant on existing legal boundaries (Sabatier, 2005). Sabatier hence views the dynamic process of watershed management through partnerships as lodged between changes seen in actual watershed conditions and the survival of the CNRM institutions themselves, considering of context, process, the civic community and actual program outputs (see Figure 2-1).

Sabatier asserts that "collaborative institutions meeting the criteria of procedural and substantive legitimacy are more likely to survive" (Sabatier, 2005, p. 287). This is why the research supports utilizing a variety of indicators, including environmental criteria to measure the success of CNRM efforts. Sabatier explains that there is support for the claim that when procedural legitimacy is met (for example participants are more satisfied with a CNRM effort that has treated them fairly), they tend to want to remain part of the effort. He

suggests that when participants see their efforts as ineffective, however (results on the ground indicate no substantial improvement), they are likely to want to withdraw from the collaboration. In sum, the difficulties associated with collecting substantive outcome measures for environmental progress is possibly a positive contributor to the survival of CNRM institutions.

Figure 2-1: A Dynamic Framework for Watershed Management: Revised



Source: (Sabatier, 2005). Swimming Upstream: Collaborative Approaches to Watershed Management. Figure 9.2. p. 286.

2.2.6 Enduring Common Pool Resource Institutions

Much of the aforementioned literature is rooted in Elinor Ostrom's seminal work on evaluating or designing promising commons (common pool resources such as water, and forests) (Ostrom, 1990). Ostrom's work in the commons literature (Ostrom 1990; 2008), suggests that groups must solve a set of problems in order to create institutions for collective action to manage common pool resource. She advanced a set of design principles for the creation of such institutions to overcome these problems. These 'Successful Principles of Community Organization and Behavior' involve the need for institutions to operate within clearly

defined boundaries; that there is congruence between appropriation and provision of rules and local conditions; that there is a condition of collective-choice arrangements (or the ability of individuals affected by the operational rules of a given arrangement to participate in modifying the rules); that there is the presence of monitors, who actively audit conditions and appropriator behavior; the presence of a system for graduated sanctions (evaluation); that there is the presence of conflict-resolution mechanisms; and finally, a need for minimal recognition of rights to organize (legitimacy). Contributing to this work, Lockwood et al. (Lockwood et al., 2010) more recently advanced a framework in which managers and policy makers may operate, under the premise of recognition that one institution alone is ill-equipped to efficiently manage large scale common pool resources. As planning research on collaborative planning recognizes 'inclusiveness' as essential. Lockwood et al. also suggest that inclusiveness plays a key part in 'Good Governance Principles for Natural Resource Management'.

Table 2-3: Good Governance Principles for Natural Resource Management

Legitimacy	- Validity of an organization's authority to govern - Power devolved to the lowest level at which it can be effectively exercised - Integrity with which authority is exercised
Transparency	- Visibility of decision-making processes - Clarity with which the reasoning behind decisions is communicated - Availability of relevant information about governance and performance in an organization
Accountability	- Allocation and acceptance of responsibility for decisions and actions - Demonstration of whether and how these responsibilities have been met.
Inclusiveness	- Opportunities available for stakeholders to participate in and influence decision making - Processes and actions
Fairness	- Respect and attention given to stakeholders' views - Consistency and absence of personal bias in decision making - Consideration given to distribution of costs and benefits of decisions
Integration	- Connection between, and coordination across, different governance levels - Connection between, and coordination across, organizations at the same level of governance - Alignment of priorities, plans, and activities across governance organizations
Capability	- Systems, plans, resources, skills, leadership, knowledge, and experiences that enable organizations, and the individuals who direct, manage, and work for them, to effectively deliver on their responsibilities
Adaptability	- Incorporation of new knowledge and learning into decision making and implementation - Anticipation and management of threats, opportunities, and associated risks - Systematic reflection on individual, organizational, and system performance

Source: Lockwood et al., 2010.

Moreover, these models have focused largely on process criteria for assessing CNRM, and perhaps indirectly proposed that procedural legitimacy will eventually lead to positive environmental outcomes.

2.3 Evaluation-Specific Models

Two prominent academic research papers have focused on how to evaluate CNRM efforts. Conley and Moote (2003) describe "Typical Criteria for Evaluating Collaborative Natural Resource Management", categorizing criteria by type: Process Criteria; Environmental Criteria; and Socioeconomic Criteria. As proponents of CNRM, the researchers were dismayed by the ways in which collaborative processes have been portrayed as a cure-all (p. 382). They acknowledged that most of the support or criticism aimed at CNRM has not been based on rigorous evaluation of processes or outcomes. Outcome criteria for ecological resources can present significant challenges for evaluators such as difficulties associated with identifying measurable goals, variability inherent in ecological data, and long timeframe required for ecological changes to occur ((Conley & Moote, 2003), this however should not be interpreted to mean they should be omitted from evaluation designs. There is value in discerning between process and outcomes (because outcomes have proven difficult to determine); however, too much evaluation has focused on measuring more readily assessed process criteria (such as groups having a broad shared vision; clear goals, inclusive participation, etc.). As CNRM efforts are cross-sectoral, and involve striving towards broad environmental goals, their evaluation should also be more comprehensive, and involve a broader set of criteria to measure success.

Similarly, Koontz (2006) suggested that the most crucial question in CNRM remains unanswered: "To what extent does collaboration lead to improved environmental outcomes?" (p. 111). Koontz addressed this gap by suggesting a list of environmental outputs and environmental outcomes. Koontz's environmental outcome indicators are largely procedural, including: agreements reached; restoration or habitat improvement projects completed; changes to public policy; changes to land management practices: education and outreach campaigns conducted: programs implemented; and protected from development.

He suggested that although their concern was with environmental outcomes, "collaborative outputs cannot be ignored because they are the intermediary causal mechanisms between collaborative processes and collaborative outcomes" (Koontz, 2006, p.114).

2.4 Cross-Cutting Themes

Table 2-4 summarizes the different strategies, principles and characteristics of reviewed collaborative governance frameworks from the literature highlighted in this chapter. Overall, successful CNRM strategies reviewed in this literature can be grouped into 16 main cross-cutting themes: accountability; adaptability; positive changes in environmental quality; land cover; biological diversity; environmental parameters; empowerment; fairness; inclusiveness; knowledge; lawfulness; legitimacy; monitoring; representation; transmission; and transparency.

Table 2-4: Summary of Collaborative Governance Frameworks for Watershed Management

Design **Principles** Illustrated by Long Enduring CPR Institutions (Ostrom, 1990)

- Clearly defined Boundaries
- Congruence between appropriation and provision rules and local conditions
- Collective choice arrangements
- Monitoring
- Graduating sanctions
- Conflict-resolution mechanisms
- Minimal recognition of rights to organize
- Nested enterprises

Strategies Used to Facilitate or Improve Co-Management (Berkes, 2009)

- Bridging Knowledge
- Co-production of knowledge
- Participatory Research
- Collaborative Monitoring
- Participatory Scenario building
- Fair/Democratic distribution of power
- Downward accountability

Good **Governance Principles** for Natural Resource Management (Lockwood et al., 2010)

- Legitimacy
- Transparency
- Accountability
- Inclusiveness
- Fairness
- Integration
- Capability
- Adaptability

Evaluating the **Democratic Character** of Collaborative Processes (Leach, 2006)

- Inclusiveness
- Representation
- Impartiality
- Transparency
- Deliberativeness
- Lawfulness
- Empowerment

The **Deliberative** System (Dryzek, 2011)

- Public space
- Empowered space
- Transmission
- Accountability

Survival of Watershed Collaboration (Sabatier, 2005)

- Procedural Legitimacy
- Substantive Legitimacy

Typical **Criteria** for Evaluating Collaborative Natural Resource Management (Conley & Moote, 2003)

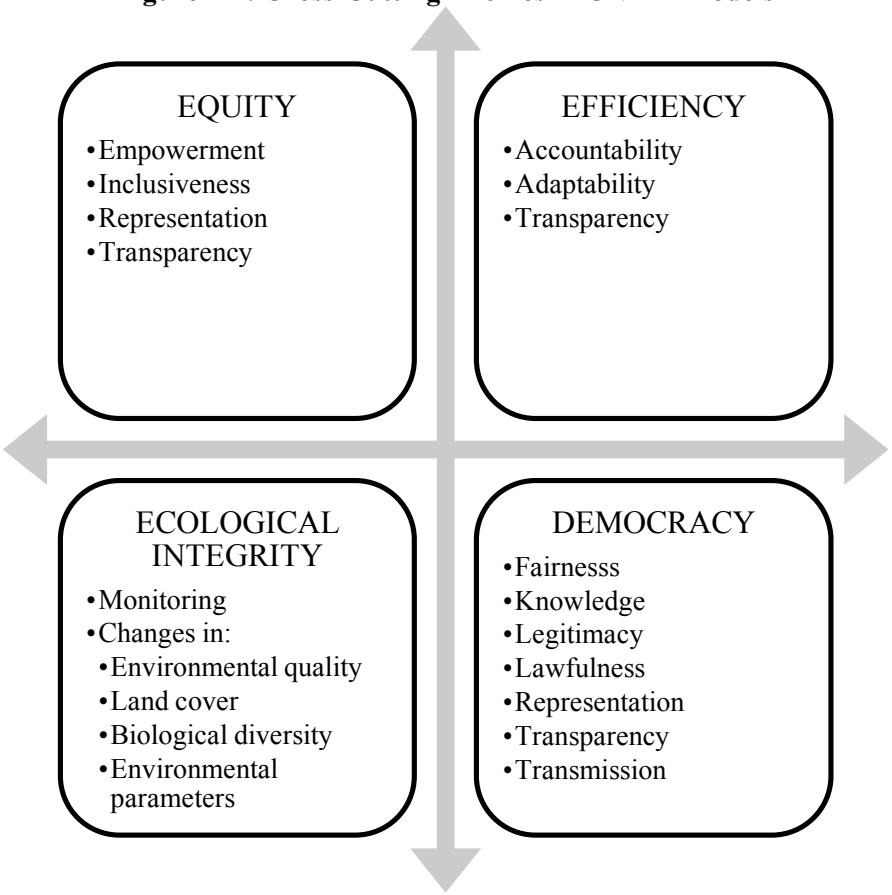
- Process Criteria
- Environmental Criteria
- Socioeconomic Criteria

Measures of Environmental Outputs and Outcomes (Koontz, 2006)

- Environmental Outputs
- Environmental Outcomes

Overall, these emerging themes can be grouped into four categories. Instead of categorizing themes according to types of measures (as Conley and Moote, 2003 and Koontz, 2006 have), or group them according to those which may be better operationalized as process criteria versus outcome driven, they are grouped here into four main rationales prevalent in the literature: Equity; Efficiency; Ecological Integrity; and Democracy (see Figure 2-2). Particular themes such as representation and transparency overlap across more than one rationale, as they are essential in those cases for different reasons, but generally, the 16 main themes clearly emerge as distinctive principles which can lead to more successful collaborations under these four broad categories. This research on how to measure the success of CNRM will focus on these underlying rationales within which collaborative decisions are made.

Figure 2-2: Cross-Cutting Themes in CNRM Models



Source: Author. Adapted from Good Governance Principles for Natural Resource Management (Lockwood et al., 2010); Strategies Used to Facilitate or Improve Co-Management (Berkes, 2009); Evaluating the Democratic Character of Collaborative Processes (Leach, 2006); The Deliberative System (Dryzek, 2011); Survival of Watershed Collaboration (Sabatier, 2005); Typical Criteria for Evaluating Collaborative Natural Resource Management (Conley & Moote, 2003); Measures of Environmental Outputs and Outcomes (Koontz, 2006).

CHAPTER 3: CONCEPTUALIZING THE RESEARCH

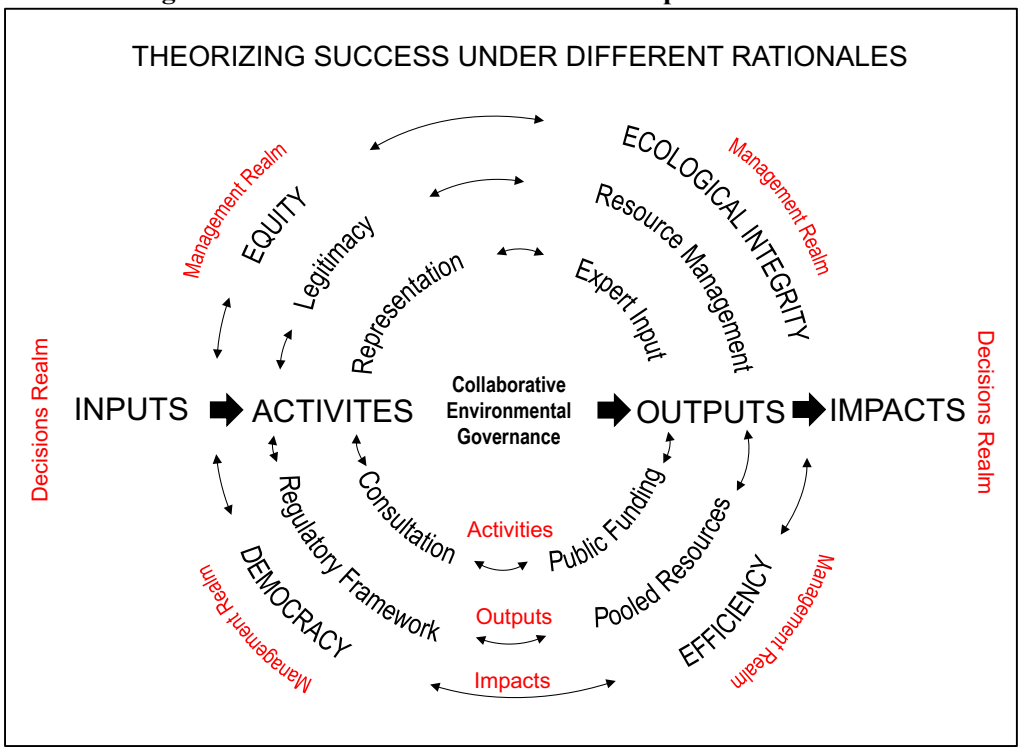
There is increasing interest in how to assess the success of CNRM efforts as they gain prominence (see Innes 1999; Innes and Booher 1999; Kellert et al. 2000; Kenney 1999; Kenney 2000; Kenney et al. 2000; Leach et al. 2000; Moote et al. 2000; Selin et al. 2000; Conley & Moote, 2003). Correspondingly, this research seeks to evaluate how decision making occurs in collaborative environmental governance arrangements through four main lenses, or rationales. Under an *equity* lens, collaborative management suggests greater representation and plurality of voices could lead to greater consensus, better outcomes, and even the empowerment of excluded (and at times disenfranchised) community stakeholders. Through an *efficiency* lens, working together as teams -- and creating partnerships to make best use of tools and resources, and to increase collective capacity -- is a prominent rationale for promoting collaborative governance efforts. There is also the notion of *democratic deliberative political* rules, or regulations that frame and advance our collective environmental goals. This framework often mandates public consultation and involvement in decision making, thereby attempting to integrate social justice into environmental actions. Finally, from an *ecological integrity*, or scientific perspective, decisions in the field of environmental management involve choosing appropriate activities (fencing for native species recovery, native plantings, invasive weeds removal, etc.) to ensure a healthy natural environment. This study investigates how these rationales have transpired in Hawai‘i’s collaborative management efforts. In order to frame the analysis of the rationales that guide group decisions, a program theory (or “theory of change”) is developed under each rationale, and decisions will be assessed based on the outcomes and impacts of the activities of the collaborative natural resource management group.

In Hawai‘i, working in partnerships to manage unique, sensitive watersheds has been undertaken in a variety of ways at various times throughout history. Recently (since the 1990s), management of Hawai‘i’s most pristine high elevation watersheds has been conducted collaboratively, through activities conducted via partnership agreements between actors from the public sector, environmental non-profit organizations,

and private landowners. The partnership agreements link stakeholders with conceivably varying sets of priorities and values so that they are working toward an ultimate common conservation goal. The success of these collaborations is conceptually difficult to assess, because "success" depends on which lens, or rationale, is used to evaluate program successes.

Figure 3-1 (below) conceptualizes this research, demonstrating how similar inputs, such as funding, can lead to a variety of activities, short-term outputs, and longer-term impacts (the decision realm). All of these would have different implications for "success" when operating from an *equity*, versus an *efficiency*, versus a *democratic*, or versus an *ecological integrity* (or technocratic) perspective (the management realm). From an *equity* perspective, a successful program would consider different objectives -- for example, focusing on whether including more people in the decision-making process leads to changes that actually reflect participant input, or actually leads to empowerment of historically under-served or under-represented groups. From an *efficiency* perspective, funding priorities in a collaborative environmental management partnership might focus on maximizing expenditures for environmental management. This would involve making sure that resource use is optimized such that the funds invested can lead to greater outcomes over time, especially if the funding has been disbursed by the public sector. Judging success of activities performed by a collaborative management group under a *democratic* rationale would center around distinctive, perhaps divergent principles, focusing on the regulatory framework within which management decisions are being made. Under a democratic rationale, attention would be directed toward whether consultation strategies have been fairly selected to invite stakeholders into a regulated or mandated process and decisions made according to fair standards. Finally, Program outcomes could also be assessed as the degree to which they improve the overall *ecological integrity* of a managed area. In this case, the success of management efforts of a program would involve scientific outcomes such as improved land cover, water quality or availability.

Figure 3-1: Collaborative Decisions Conceptual Framework



Source: Author.

3.1 Propositions and Research Questions

This research is informed by a series of propositions, emerging from recognized sets of assertions and criticisms within the existing body of literature covered in Chapter 2: on the topic of collaborative natural resource governance. These propositions frame each of the following research questions:

1. ***CNRM groups collaborate for different reasons: In order to assess whether or not a collaborative effort is successful, one must first acknowledge and understand the participants'/members' motives for participating.***
    - How do prevailing rationales frame our ability to evaluate "successful" decision-making in collaborative natural resources management efforts?

2. ***Involving more stakeholders to participate in a decision-making process makes collaborative efforts more just, promoting more equitable outcomes. (Equity)***
    - How do representation, voting mechanisms, and consultation strategies impact decision-making?

3. ***In resource management, cross-sector collaborations lead to more efficient outcomes than do those conducted by sole-sector efforts, especially more than solely state-driven initiatives. (Efficiency)***
    - How does funding impact decision-making?
    - How is public funding allocated and to whom?
4. ***Policies that mandate public participation in environmental management are central to promoting environmental justice and the principles of democracy. (Democracy)***
    - How do state environmental policies that mandate public input support or undermine public participation in resource management?
5. ***Managing resources collaboratively leads to better environmental outcomes than when one group takes sole responsibility. (Ecological Integrity)***
    - Are activities conducted leading to tangible, measurable on-the-ground improvements in Hawai‘i?
    - Do they lead to better managed upper-watersheds and ultimately improve natural ecosystems and/or water re-charge?

3.2 Partnerships and Rationales

While there are numerous rationales for collaborating and a broad range of motivations behind partnership formation, partnerships will commonly include these features: (1) Jointly determined goals; (2) Collaborative and consensus-based decision making; (3) Non-hierarchical and horizontal structures and processes; (4) Trust-based and informal as well as formalized relationships; (5) Synergistic interactions among partners; and (6) Shared accountability for outcomes and results. (Brinkerhoff & Brinkerhoff, 2011).

Partnerships differ from other types of participatory policy-making. They typically focus on broader issues; they involve multiple number of stakeholders from a range of sectors; and they also usually do not have a finite duration (they are long-lasting arrangements). Table 3-1 outlines the main differences among partnerships, advisory committees, public hearings, and negotiated rule-making (Leach et al., 2002). The scope of issues addressed in CNRM partnerships, the range of stakeholders potentially impacted, and the

potential for policy changes possible due to the nature of these longer lasting agreements, make partnerships more complex than other forms of collaborative efforts.

Table 3-1: Traits of Stakeholder Partnerships and other Related Forms of Participatory Policy-Making

	Issues	Participants	Stages of Policy Cycle
Stakeholder Partnership	**Multiple issues** united by a common theme, addressed sequentially or simultaneously	Interest groups, citizens, and multiple federal, state and local agencies; meetings **typically open to the public**	Full cycle (problem definition, planning or decision-making, implementation, assessment); **indefinite duration**
Advisory Committee	A specific project or program conducted by a public agency or private enterprise	Interest groups, technical experts, and/or public agencies, selected by the sponsor	May address any or all stages, over an extended period of time, depending on the scope of the sponsor's project or program
Public Hearing	A specific project proposed by an agency or private developer	The project proponent, interest groups, citizens, and one or more permit-issuing agencies; meetings open to the public	Planning stage only; timing is often driven by statutory deadlines; disbands after the plan is finalized
Negotiated Rule-Making	A specific proposed regulation	Affected interest groups, selected by one rule-making agency	Rule-making stage only; disbands after the rule is finalized

Source: Leach, W. D., Pelkey, N. W., & Sabatier, P. A. (2002). Stakeholder partnerships as collaborative policymaking: Evaluation criteria applied to watershed management in California and Washington. *Journal of Policy Analysis and Management*.

Partnerships have increasingly been touted as means to endorse different agendas. For example, partnerships have most commonly been promoted in order to enhance effectiveness in public institutions. See for example the literature on New Public Management (NPM)/New Public Governance (NPG) from (Osborne, 2006) explaining how these new models lead to improvements in the efficiency and effectiveness of public administration services. Brinkerhoff & Brinkerhoff (2011) suggest that generally, people choose to form partnerships for three additional reasons (in addition to efficiency and effectiveness). They suggest some rationales for partnerships have also historically been prompted by sheer compliance, or by legislative directives to act collectively to address complex problems (such as natural resource management for example). Sometimes partnerships have also been promoted as a conflict resolution approach, especially for collective action problems where no one "winner" can be identified. Finally, partnerships have also gained support for more normative reasons, such as for more open decision-making, encouraging greater representation, and supporting democratic processes.

3.3 Rationales for Participating

Assessing the progress, the success, or the worth of any collaborative effort will always reflect the priorities and values upon which they are evaluated. Based on the body of literature reviewed in the previous chapter, and more recent research on traits of participatory policy-making above, I have identified four main rationales for collaborative approaches to the management of natural resources. These are *equity*, *efficiency*, *ecological integrity* (ecosystem services), and to advance the tenets of *deliberative democracy*.

Based on the rationale of *equity*, successful collaborations will concentrate on the benefits of including a broad range of stakeholders in managing area resources. These collaborations would center on consensual decision making both in terms of how decisions are made and also in terms of who has the power and influence in decision-making. Successful collaborations undertaken under an *efficiency* rationale would center on making the most of pooled resources, concentrating on doing as much as possible for the least amount of economic input. This rationale frames a great deal of existing government decision-making, focusing on transparency and making best use of public funds for the public good. Another rationale, *ecological integrity*, has been used to validate and encourage collaborations that actually lead to on-the-ground improvements, to better environmental outcomes than efforts made by one sector (for example the public sector alone). Finally, collaborative management has been undertaken under the tenets of *deliberative democracy*, through mandated laws and protocols, and for due diligence.

I separate an equity rationale from democracy, even though much of the literature has seemingly conflated the two, suggesting on numerous occasions that both are interested in advancing principles of increased representation and actively engaging a broader range of stakeholders. Some scholars have raised concerns about political distinctions between participation and active engagement, suggesting "an instrumental or legalistic rationale towards participation is a logical choice for those tasked with implementing environmental policies" (Wesselink et al., 2011, p. 2698); however, a legalistic rationale is often neglected in academic commentary because it tends to conflict with an emerging normative rationale prevalent in

scholarship on deliberative governance (see Chilvers, 2008) because the legal realm focuses on justice, and not concepts of fairness, or equity (what is just, is not always fair). Hence, I see serious implications in this divergence, as they lead to "different choices about the who, what, and how of participation and to different criteria for success" (Wesselink et al., 2011, p. 2698). I also consider the priority accorded to efficiency, and on the need for public institutions to justify the funding stream allocated to one program over another in order to remedy public concerns about water management. I also analyze the tenets of ecological integrity, which focus on protecting earth's natural systems and the government sector's continued capacity to provide services for living, thriving communities over time.

Investigation into various rationales have also previously been examined. Recently, some scholars (e.g., Wesselink et al., 2011) have conceptualized participation rationales as instrumental, substantive, normative, and legalistic. Their understanding of participation rationales is derived from Fiorino (1990) and subsequent works by Blackstock and Richards (2007) and Stirling (2006; 2008) sought to expand approaches to evaluating environmental risk to reflect more democratic values. In this work, an instrumental rationale was defined as: effective participation that makes decisions more legitimate and improves results. It aims to restore public credibility, diffuse conflicts, justify decisions, and limit future challenges to implementation by creating ownership. In such a rationale [or model], "Policy goals are not open for discussion; only the details are (to a lesser or greater extent). It hereby supports incumbent interests" (Wesselink et al., 2011, p. 2690). Under a substantive rationale, "non-experts see problems, issues, and solutions that experts miss. It aims to increase the breadth and depth of information and thereby improve the quality of decisions; it ignores power issues (e.g., related to problem framing). Unlike the case of the instrumental rationale, policy goals can be changed in a substantive rationale" (p. 2690). Finally, the research defines the normative rationale for participation, clarifying that "democratic ideals call for maximum participation. It aims to counter the power of incumbent interests and allows all who are affected by a decision to have influence" (p. 2690). Wesserlink et al. also include a legalistic rationale, to define participation that is organized to

meet formal requirements such as consultation through environmental regulation. Their research therefore supports my own observations:

> The questions have to be more general than to improve participatory processes per se. What are we trying to achieve? Is this legitimacy, effectiveness, efficiency, or representation? Do all relevant actors agree? Is participation necessarily the best way to realise these goals? What if actors have different purposes and resources? Conversely, while participation is considered a solution by many, the existence of separate participation rationales indicates that the problems they are trying to solve are very different (p. 2699).

It is clear that further research should consider not only how the process itself advances the success of participatory programs, but also the underlying motivations of the participants. The research on rationales for participation also indicate the significance of considering the principles of democracy as separate and distinct from those of equity.

CHAPTER 4: METHODS

This case study research has involved the use of mixed-methods (Creswell, 2006), beginning with qualitative data gathering through semi-structured interviews, a follow-up electronic assessment, and the analysis of secondary data. The research began with interviews of eight of the ten WP Coordinators (Initial WP Management Interviews), in order to gain a better understanding of the HAWP organization, to seek greater clarity on partnership staff counts, and to inform the design of a follow-up assessment of the organizations' staff and/or management (see Section 4.1). An electronic questionnaire was also administered the WP Coordinators to elicit a comparable set of data about perceptions of Program growth and success (see Section 4.2). The archival research conducted for this research involved a review of WP Management Plans, Annual Reports to the State of Hawai‘i Legislature, as well as visits to the Hawai‘i State Library, the University of Hawai‘i at Mānoa Library, the Legislative Reference Bureau, and the Hawai‘i State Archives. The purpose of these visits was to retrieve historical documents pertaining to the history of Hawai‘i's watershed management, as well as WP Annual Reports to the Legislature going back to 1991 (see Section 4.3).

4.1 Interviews and Communications

The first interview for this research was held with the then-current State WPP Planner, in person at the DLNR/DOFAW offices in Honolulu in January 2015. The first interview was intended to discuss the Program, as well as ask the State Planner whether she thought: 1) that the State would support an association-wide study of the individual partnerships in HAWP; and 2) the individual partnerships' staff would be amenable to participating in this study. The then planner suggested I attend the HAWP annual conference in February 2015, in order to meet some of the WP staff and perhaps start to ask them about their willingness to talk with me in the future. I attended the Annual Conference on February 23, 2015 and introduced myself to some of the various WP staff members at that time. The then WPP Planner shared with me some of the WP Management Plans at our first meeting (the ones she was in possession of, but

asked me to check with individual partnerships about the latest available version of these plans when meeting with them in the future). The Planner told me that the State would benefit from having someone study the partnerships and offered to help in any way she could. Shen then also shared with me the names and email contact information for each of the individual WP Coordinators (who are essentially the Directors of each individual partnership).

My second interview was held over the phone with then HAWP Chair Trae Menard (the HAWP elects an association-wide chair every two years on a rotational basis). During this phone interview, I asked the Chair about some historical background of HAWP as well as his thoughts on the other partnerships' staff's willingness to participate in a study about decision-making in Hawai'i's Watershed Partnership Program. The HAWP Chair explained that while all of the HAWP staff is quite busy, he thought many would be very willing to participate and support this research (willing to talk or offer data if I asked).

Shortly after the conference, the WPP Planner at DLNR/DOFAW moved to another position on the Island of Hawai'i and was replaced by another Planner – one I had previously met in Graduate School. The new DLNR/DOFAW WPP Planner and I met to discuss HAWP for the first time in November 2015. She was also very supportive of my research and offered to be of help in any way she could. I then told her that my first step in this research would be to go to all of the individual WPs across the state in person to speak with the WP Coordinators to talk about my research; see where the work they conduct is located; meet with their staff; establish rapport; and gauge their willingness to participate in the research.

Initial interviews with all ten of the WP Coordinators were attempted starting in early 2016. An email was sent to each WP coordinator individually, introducing myself and explaining that I would like to come in person to meet with them to talk about the history of their partnership, and my desire to eventually have them participate in an association-wide survey that would ask about the activities their partnerships conduct, and how they perceive the impact of their activities.

Table 4-1, below lists the names, titles, date, and types of communications and interviews conducted for this research. Overall, a total of 19 individuals were interviewed for this research between January 2015 and March 2018.

Table 4-1: Interviews and Discussions Conducted

Name	Title	Date(s)	Type
Katie Ersback	Planner, DOFAW, WPP (current)	11-09-2015 11-16-2015 11-25-2015 03-21-2016 07-15-2016 08-01-2016 03-19-2018	In-person discussion at DOFAW Email communication Email communication Email communication In-person discussion at DOFAW Email communication In-person discussion at DOFAW
Lisa Ferentinos	Planner, DOFAW WPP (former)	01-09-2015 01-23-2015	Email communication Phone discussion
Dan Eisenberg	Coordinator, EMWP	01-05-2016	In-person interview, Pukalani, Maui
Chris Brosius	Coordinator, WMMWP	12-14-2015 01-06-2016 03-19-2018	Phone discussion In-person interview, Makawao,Maui In-person discussion at DOFAW
Andrea Buckman	Coordinator, LHWRP	01-05-2016	In-person interview, Makawao, Maui
Tracy Gotthardt Richard Pender	Coordinator, KMWP Natural Resource Manager, KMWP	01-20-2016	In-person interview, Pearl City, Oʻahu
Trae Menard Melissa Fisher	Coordinator, KWA (former) Coordinator, KWA (current)	01-22-2015 03-03-2016	Phone discussion In-person interview, Līhuʻe, Kauaʻi
Mellora Purell Cody Dwight	Coordinator, KWP (former) Coordinator KWP (current)	02-10-2016	In-person interview, Waimea, Hawaiʻi
Colleen Cole	Coordinator, TMA	02-11-2016	In-person interview, Hawaiʻi National Park, Hawaiʻi
Cheyenne Hiapo Perry	Coordinator, MKWA	02-10-2016	In-person interview, Hilo, Hawaiʻi
Yumi Miyata	Coordinator, WMWP	11-30-2015	Phone discussion
Mark Fox	External Affairs Director, The Nature Conservancy	07-07-2017 03-19-2018	In-person interview, Honolulu, Oʻahu In-person discussion at DOFAW
Marc White	Former Maui Program Director, Maui, TNC	08/16/17	Phone discussion
Michael Buck	Former DLNR DOFAW Natural Area Reserves, Administrator	08/17/17	In-person interview, Waimānalo, Oʻahu
Christen Mitchell	Former NARS Planner, DOFAW	09-22-2017	Email communication
Ken Hiraki	Former Hawaiʻi State Legislator	09-27-2016	Phone Interview

Note: Only email communications that involved actual data collection are included here. Email communications about scheduling phone or in-person interviews are not included here.

The first in-person interview of the WP Coordinators occurred in Maui in January 2016, with the Coordinator of the first-established East Maui Watershed Partnership (established in 1991). On that trip to the island of Maui in January 2016, I was able to meet with all three Maui-based WP Coordinators. I also traveled to the Island of Hawai‘i in February 2016, where I interviewed the three Hawai‘i-based WP Coordinators, as well as to the Island of Kauai in March 2016, where I was able to meet with the Kauai-based Coordinator and Assistant Coordinator. The WP Coordinator and Resource Manager for one of the WPs on Oahu agreed to meet with me at their O‘ahu-based office in January 2016, but while I made numerous attempts (via email and phone) to contact the WP Coordinators for the other O‘ahu-based WP Coordinator, I never received a confirmation of time or place. I also never received an answer from the Moloka‘i-based WP Coordinator. Overall, I was able to engage the commitment of eight out of ten WP Coordinators, an 80 percent success rate. All in-person interviews were recorded with the use of a recording device and later transcribed.

4.2 Structured Questionnaire

An electronic questionnaire (Program-wide structured questionnaire) was sent to all (ten) partnership Coordinators on May 2, 2016. A copy of the questionnaire is included in this research’s Appendix **(**APPENDIX C: Program-Wide Structured Questionnaire Instrument). The electronic link was accessible until July 4, 2017. A total of eight responses were gathered and assessed (an 80 percent success rate). The structured questionnaire consisted of a total of 14 questions, including questions about each partnership’s activities; the activities they see themselves making most progress on; thoughts on the overall health of the areas they manage; non-partner community participation in partnership activities; ways in which feedback was collected by them from area non-partner community members; local area issues brought up by local community members; their sense of potential impact within their managed area; frequency of community feedback and means to receive it; overall response to the feedback received from non-partner community members; and decision-making styles. The structured questionnaire responses were used to answer many of the questions that are outlined in the following pages (see the evaluative frameworks that have data

sources for each of the rationales in Section 4.5). The in-person interviews conducted prior to the administration of the electronic questionnaire played a large role in the Coordinators' willingness to participate, and consequent high response rate.

4.3 Archival Research

Management Plans, Annual Reports to the Legislature, laws, and various books were also scoured to inform the historical background for this research, as well as to situate it within today's regulatory framework. Few partnership Management Plans were available online. Most of the Management Plans were obtained from the past and current WP Planners and/or the WP Coordinators. Annual Reports to the Legislature of Hawai‘i (Department of Land and Natural Resources, Division of Forestry and Wildlife State of Hawai‘i) for years 1991, 1992, and 1997 were found at the University of Hawai‘i Library. Legislative Reports for 2000-2017 were obtained online. The Legislative Reports provided not only excellent background on the evolution of partnerships, but also information on funding and on progress that justified funding requests to State legislators. A review of State laws was also conducted to understand the ever-changing regulatory framework under which the partnerships have evolved. Finally, various books, reports and articles specifically relating to Hawai‘i's watershed protection were scrutinized for information.

Two trips to DLNR's WPP Programs were also necessary in order to go through historical files in boxes left behind by past WP staff to find information about Program funding (information that is otherwise not available). While the search was extensive, it provided very little reliable information about State funding to individual partnerships. Lack of consistent and reliable information gathering about State investments is one limitation of this study.

4.3.1 Management Plans

Management Plans for each of the WPs is a requirement from the State DLNR/DOFAW, which funds a portion of the individual partnership's activities each year. Some Management Plans for HAWP are

available online, on the partnerships' websites. Others were obtained from current and past DLNR/DOFAW planners, or directly from individual WP Management. According to legislative reports, "In 2005, the Legislature authorized the use of NARF to support projects undertaken in accordance with watershed management plans negotiated with private landowners. This allowed partnerships to pursue other federal, county, and private funds by using these State funds as leverage." (Department of Land and Natural Resources, Division of Forestry and Wildlife State of Hawai'i, 2012).

4.3.2 Annual Reports to the Legislature

According to Hawai'i Revised Statutes (HRS § 195-6.6, 2013), DLNR/DOFAW must annually submit a comprehensive status report on the natural area reserves system and the natural area partnership program. This must be delivered to the governor and the legislature no later than 20 days prior to the convening of each regular legislative session. The Reports must include:

1. A description of activities and accomplishments;
2. Compliance with chapter 42F requirements;
3. An analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the management plans;
4. The status of public hunting opportunities;
5. The financial condition of the fund, including receipts and expenditures for the fund for the previous fiscal year; and
6. Plans and management objectives for the next fiscal year.

4.4 Implementation Theory and Program Theory

In order to frame the analysis for this research, data were collected, processed and analyzed using an evaluative framework that asked: *To what extent are Hawai'i's watersheds effectively managed?* The inquiry was guided by specifically looking at the Programs' activities and their mechanisms of change. The combination of implementation theory (activities and decisions) and program theory (mechanisms of change) helped to formulate appropriate "theories of change" (Weiss, 1998, p.58) for the Program assessed under each of the rationales.

4.4.1 Theories of Change

Measuring the success of a program – in this case the formation of a public-private partnership with a mission to "Sustain, promote, and build the capacity of Watershed Partnerships in Hawai'i" (HAWP Website, 2017) – cannot simply consist of output numbers without knowing more about how things develop in between (Funnell & Rogers, 2011). Articulating a program theory is often a better way to understand those causal processes that may help or hinder the progress of a program. This has been recognized as producing more useful evaluations (Weiss, 1998; Funnell & Rogers, 2011). Unlike most programs in which it may be possible to measure X in order to estimate values of Y, CNRM efforts (and other collaborative programs) exist among multiple rationales or strands (i.e., political, economic and social) and on many levels (institutional, community, individual etc.) (Connell & Kubisch, 1998). They are also developing under a collaborative process that involves diverse stakeholders that also evolve continuously.

Weiss (1995) defines a theory of change quite simply and elegantly as a theory of how and why an initiative works. A theory of change posits presumed eventual outcomes from program activities (implementation) and its mechanisms of change (the program's theory). Establishing a theory of change to assess outcomes of a collaborative effort makes great sense, as "Considering the beneficiaries of programs as actors situated in a stratified reality in which they will act and react, theory-based approaches allow for different ways of conceiving how particular means and policy instruments will work to produce good outcomes" (Stame, 2004, p.71). Theories of change are also useful when desired final outcomes might emerge past the timeframe in which the evaluation can be completed.

In CNRM groups, there is added complexity as programs involve multiple actors and, arguably, assumptions about a theory of change might involve choosing one theory over another, which can lead to different advantages (both in terms of how change happens and strategic advantages of choosing one assumption over another in any desired context) (Stein & Valters, 2012). In an article about the uses of

evaluation, Carol Weiss asserts that "The choice of measures (or in qualitative evaluations, the focus of study) can influence program operations" (Weiss, 1998 p. 26). Outcomes are largely influenced by what is actually being looked at. Depending on questions being chosen and program elements being focused on, what is being uncovered in the evaluation is largely influenced by the study's design. What the design turns out to be is also largely defined by the evaluator, who is often hired by a group or persons with clear motivations about what they deem positive, or demonstrative of program success. Hence choosing applicable designs -- including developing a narrative for a theory of change – requires attention to whose interests it may serve. While attempting to remain neutral, the evaluator is also influenced by his or her own sets of values and motivations. Being clear on the motivations driving the evaluation is perhaps even more important than results stemming from the evaluation.

4.5 Evaluative Framework for Each Rationale

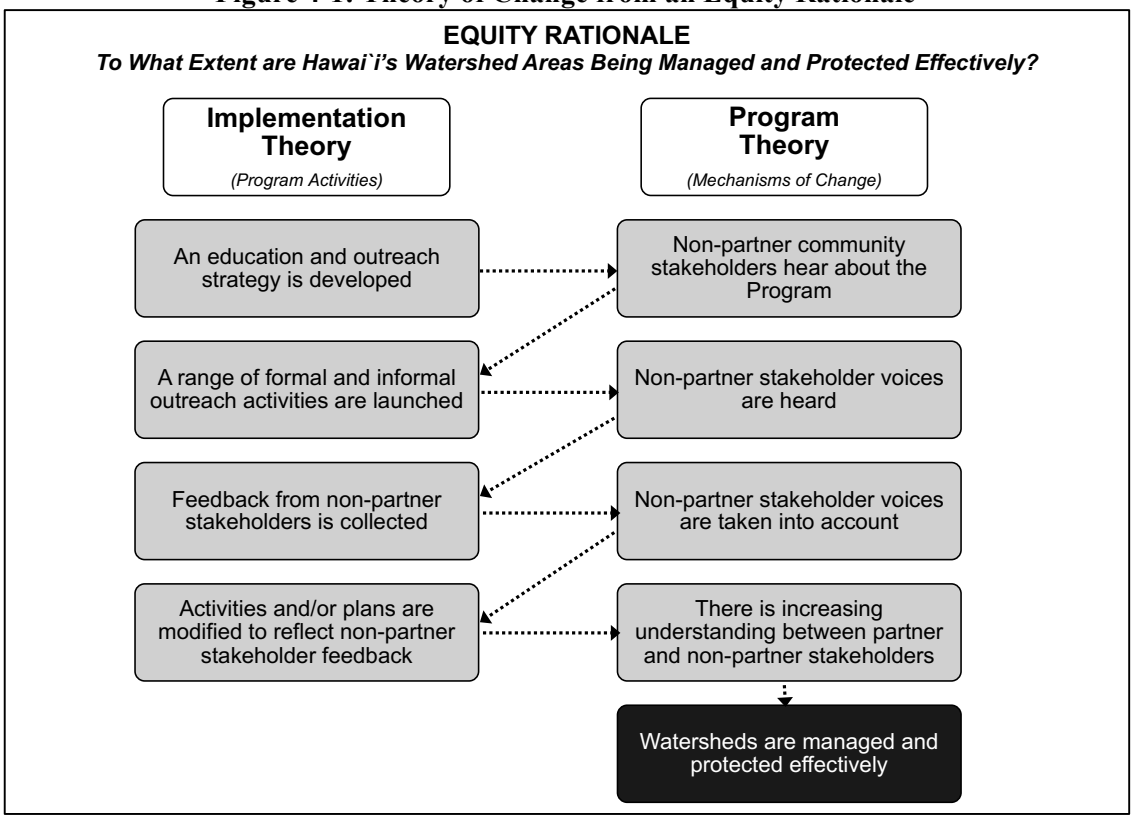
The degree to which Hawai'i's watersheds are effectively managed is assessed through each of the four lenses for decision-making (equity, democracy, efficiency, and ecological integrity). Each of the assessments focus on the same desired outcome *(Hawai'i's watersheds are effectively managed)*, but each assessment will be conducted through the lens of its unique theory of change. Only one theory of change is elucidated for each model in order to make this research feasible, but it is important to note that a thorough evaluation would likely involve more than one theory of change, possibly even involving theories of change across rationales. It is also assumed that the inputs to the Program remain the same across all rationales. The inputs into the theories' logic models will all include identical funding and personnel, as well as shared resources (i.e., equipment, funding, and/or manpower).

4.5.1 Equity Model

Through an equity lens, effectively managing and protecting Hawai'i's watersheds would involve a decision-making process that would be inclusive by involving non-partner community stakeholders, thus leading to greater understanding and consensus among stakeholders, possibly even better outcomes. Under

this approach, program activities would be assessed as leading to equitable outcomes for the Program. Under this theory of change: 1) the establishment of an education and outreach strategy is developed in order to inform non-partner community stakeholders about Program efforts and to more effectively involve them; 2) various outreach activities are proposed and conducted in order to give an outlet for non-partners to speak about their ideas to Program representatives; 3) a mechanism for collecting comments or feedback from non-partners is devised in order to ensure the consultation with non-members is actually being recorded/recognized; 4) modifications to watershed management activities and plans are made reflecting non-partner comments; and finally 5) the mauka watersheds are effectively managed because program activities have created an environment that has fostered a greater understanding between partner and non-partner stakeholders (see Figure 4-1, below).

Figure 4-1: Theory of Change from an Equity Rationale



Source: Author.

The evaluative questions used to assess the equity rationale include:

- Has the Program developed an outreach education strategy and/or invested time or resources into such a Program?

- Are there any landownership requirements to become a member of the Program?
- How does representation in the Program impact decision making in Hawai‘i’s partnerships?
- What does the partner representation in the membership look like?
- Are partners from various sectors?
- What types of consultation strategies has the Program used to engage the local community where they conduct their work?
- How is feedback from non-partners collected?

The Evaluation Plan below (Table 4-2) outlines how these evaluative questions were answered. The Plan outlines the specific activities performed by the Program, as well as the expected short- and long-term outcomes of the activities. The Plan also explains how the theory of change was assessed, by highlighting indicators for each of the outcomes. Data sources for each indicator are also included here.

Table 4-2: Evaluation Plan for an Equitable Theory of Change

WATERSHEDS ARE MANAGED AND PROTECTED EFFECTIVELY				
INPUTS	**ACTIVITIES**	**OUTCOMES**	**INDICATORS**	**DATA SOURCE**
Funding Personnel Equipment Manpower	Developing an education and outreach strategy	Non-partner stakeholders hear about the Program	Strategy is clearly outlined on WP website and Outreach staff retained	Interviews, management plans, and WP websites (4.5.1.1)
	An education and outreach coordinator is hired	Non-partners participate in education and outreach efforts	Increasing number of volunteer hours	Publicly available reports to the Legislature (4.5.1.2)
	Program holds regular volunteer hikes and/or other outreach activities	Non-partners learn about Program efforts and relationships are forming	There are no land-owning membership requirements	Coordinator interviews (4.5.1.3)
	Partners are recruited	Partners are representative of the community	No one sector is overly represented (Private, public, non-profit)	Coordinator interviews (4.5.1.4)
	Feedback from non-partners is collected	Feedback from non-partners is received by the Program	Frequency of feedback collected from non-members (through formal and informal mechanisms)	Program-wide structured questionnaire (4.5.1.5)
	Management activities are undertaken and Management Plans are drafted	Non-partner feedback is acknowledged and concerns are addressed	Feedback received leads to changes in Program activities and/or plans	Program-wide structured questionnaire (4.5.1.6)
	Management activities and Management Plans are amended	Partnership is inclusive	Assessment of organizational openings, opportunities, and obligations as it relates to participation	Program-wide structured questionnaire (4.5.1.7)

Source: Author.

4.5.1.1 Outreach Strategy

The presence and/or nature of each partnership's strategy to engage non-partner community members (including through educational programs, as well as via events) in Program activities was collected using qualitative information collected via in-person interviews with WP Coordinators. Outreach, for the sake of this research, is any attempt to engage non-partner community members, and a strategy is defined as a formal mechanism to promote this engagement (such as the advertisement of Program activities on the WP website).

4.5.1.2 Volunteer Hours

In order to gauge the extent of WP outreach activities, the number of hours volunteers spent working with WP staff on WP activities is collected (via Annual Legislative Reports) and presented as increasing hours over time.

4.5.1.3 Landownership Requirements

Specific landownership requirements to becoming a partner in Hawai'i's WPs is collected through in-person Coordinator interviews. In an original interview over the phone with a past WPP Planner, landownership requirements were reported to be restricted to area landowners of more than 4,000 acres, but no formal requirements could be located to support this statement. The interviews with individual WPs inform the research on the specifics of who can become a member, and whether or not a member (partner) needs to own land within the managed area (and if so, how much).

4.5.1.4 Partner Representation

The assessment of representation across partnerships (with partners from the public (federal, state and county); private; and non-profit (local and national) sectors is conducted by the author using data collected from WP websites, as well as feedback received from WP Coordinators during in-person interviews.

4.5.1.5 Feedback Gathering Strategies

Feedback gathering strategies are assessed by looking at the frequency of formal and informal consultation strategies used in the past by the organization to gather feedback from non-partner community stakeholders.

A number of possible strategies stemming from a thorough review of literature on consultation strategies has been chosen. The list is not exhaustive (and can be tailored for the assessment of various group efforts), but it captures the many ways stakeholder input could be received. These include: Environmental review (HEPA, NEPA etc.); City and County level hearings; formalized agreements (MOUs, MOAs); court mandates; protests; management plans; referenda; public hearings; public opinion surveys; focus groups; and events that foster the exchange of cultural or scientific protocols.

Attempting to assess degree of inclusiveness in how a group makes decisions must involve a review of (1) the frequency in occurrence of these input techniques; and (2) whether these have led to actual decisions being changed or made over time (defined as the next five years). Community consultation strategies are sometimes used as lip service, and do not lead to actual input in decisions made. The assessment of feedback gathering strategies involved asking these two additional questions as part of the Program-wide structured questionnaire:

- How, if at all, are non-partners included in the choice of activities the Watershed Partnerships perform, and plans they draft?
- Are consultation strategies and feedback received from various consultations with non-partner community stakeholders actually impacting decision-making?

4.5.1.6 Visions and Goals in Management Plans

Visions and goals outlined in management plans should reflect the values and interests of stakeholders involved. Capturing stakeholder input in the plans means assessing the degree to which comments received actually make their way into the written documents. Stakeholders involved in drafting the documents are aware of whether or not their stated vision, goals, activities and programs reflect the values of excluded members to the extent they have attempted the above-mentioned strategies, and have used the feedback received to compose, add to or amend their management plans. This information was elicited through the Program-wide structured questionnaire administered to WP coordinators.

4.5.1.7 Gauging Inclusiveness

Ultimately, a framework for assessing the degree of inclusiveness in the Program requires an inquiry into the organization's rules and systems in place. *Openings, Opportunities, and Obligations* within the organization are crucial to measuring inclusiveness. A framework with which to assess inclusiveness through the group's *organizational rules and systems* in place has been constructed. This framework is adapted from Arnstein's Ladder of Citizen Participation (1969), which assumes that citizen power moves from Non-Participation to Degrees of Tokenism to Degrees of Citizen Power, in a process moving from (1) Manipulation; (2) Therapy; (3) Informing; (4) Consultation; (5) Placation; (6) Partnership; (7) Delegated power; to finally, (8) Citizen Control. It is also informed by Rocha's Ladder of Empowerment (1997), who argued that "while Arnstein's ladder moved conceptually along increasing levels of the same type of power, the ladder of empowerment moves conceptually from a focus on the individual to community experiences of power, wherein different experiences are combined to create individual and community outcomes" (p. 33). Finally, the framework also bases its model on research from child psychology, particularly Harry Shier's *Pathways to Participation: Openings, Opportunities and Obligations* (2001). Shier suggests that participants move from being (1) listened to; (2) then supported in expressing their views; (3) then taken into account; (4) then actually involved in the decision-making process; and at the highest level of participation (5) actually share power and responsibility for decision-making. Shier explains that at each level of participation "individuals and organizations may have differing degrees of commitment to the process of empowerment" (p. 110). His model identifies three stages of commitment at each participation level: *openings, opportunities, and obligations.* He offers an interesting way to capture not only the outcomes of participation, but also the more dynamic aspects of process.

The framework used in the CNRM literature reviewed in Chapter 2: generally assumes that groups already involve all stakeholders in the partnership (possibly unlike for this case study). This assessment has taken into account that for Hawai'i CNRM groups, membership might be at the onset restrictive. The table below (Table 4-3) explains how the assessment considers members' views on existing rules and systems in place

that promote participation of excluded, non-partner community stakeholders in partnership activities and ultimate outcomes. It focuses on asking existing members about openings, opportunities, and obligations their organizations utilize to promote organizational commitment, as well as the scale upon which this is measured (levels of participation) from listening, to supportive, to non-member views being taken into account, to non-members actually being involved in decision making, and finally to non-members actually sharing power in the decision-making process (see Table 4-3).

Table 4-3: Organizational Rules and Systems in Place Assessment

	OPENINGS	***OPPORTUNITIES***	***OBLIGATIONS***
LISTENING Stakeholders are listened to	Is the group ready to listen to non-partner community stakeholders?	Does the group work in a way that enables them to listen to non-partner community stakeholders?	Is it a policy requirement that non-partner community stakeholders must be listened to?
SUPPORTIVE Stakeholders are supported in expressing their views	Is the group ready to support non-partner community stakeholders in expressing their views?	Does the group have a range of ideas and activities to help non-partner community stakeholders express their views?	Is it a policy requirement that non-partner community stakeholders must be supported in expressing their views?
TAKEN INTO ACCOUNT Stakeholders' views are taken into account	Is the group ready to take non-partner community stakeholders' views into account?	Does the group's decision-making process enable them to take non-partner community stakeholders' views into account?	Is it a policy requirement that non-partner community stake-holders' views must be given due weight in decision-making?
INVOLVED IN DECISION-MAKING Stakeholders are involved in the decision-making process	Is the group ready to let non-partner community stakeholders join in their decision-making processes?	Is there a procedure that enables non-partner community stakeholders to join in decision-making processes?	Is it a policy requirement that non-partner community stakeholders must be involved in decision-making processes?
SHARING IN POWER Stakeholders share power and responsibility for decision-making	Is the group ready to share some of their organizational power with non-partner community stakeholders?	Is there a procedure that enables non-partner community stakeholders and the organization to share power and responsibility for decisions?	Is it a policy requirement that non-partner community stakeholders and the organization share power and responsibility for decisions?

Source: Author. Adapted from A Ladder of Citizen Participation, Sherry, R. Arnstein, 1969; A Ladder of Empowerment, Rocha 1997; The Right to Play and Children's Participation, in The Article 31 Action Pack, published by PLAY-TRAIN, Roger Hart, 1992; and Pathways to Participation: Openings, Opportunities and Obligations, Harry Shier, 2001

4.5.2 Deliberative Democracy Model

Through a democratic lens, partnerships would operate in a fair and balanced democratic way; consultation with community members would occur and partnership activities would lead to more knowledge about appropriate environmental legislation and even prompt new regulation. While the democratic model cannot

be imposed on private landowners (in fact could be a deterrent for some private partners), it is advanced here as an ideal foundation for a successful collaboration. This approach is justified here because of two main reasons: 1) while the watershed areas managed by each of the WPs might not consist entirely of public lands, the ensuing outcomes of management activities impact areas well beyond the WP boundaries and are part of a district-level planning area; and 2) in the WP itself, all partners benefit from the public funding allocated to the group (whether the partners are private or public entities). The expectation that public funding allocated to a collaborative entity cooperating democratically is thus sensible.

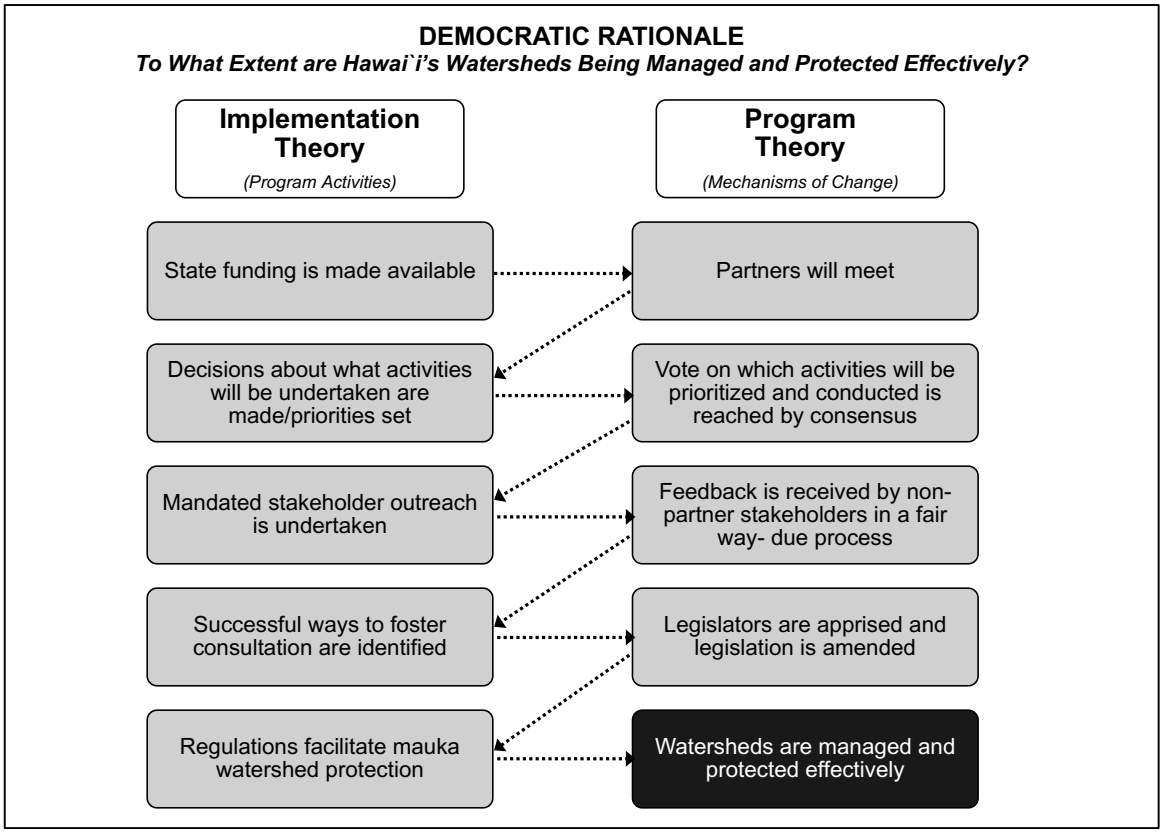
The theory of change developed to assess the democratic merits of WP activities suggests that 1) with public funding appropriated for partnership activities, partners will be able to meet to deliberate and prioritize specific management priorities; 2) the theory further suggests decisions within the partnerships will be reached by vote, ultimately striving for consensus among partners; 3) the theory also highlights the adherence to mandated regulations involving public consultation with non-partners, and posits that this process will enable excluded members to have an opportunity to have a voice; 4) partners are assumed to identify ways to conduct their activities with input from non-partners; 5) in certain circumstances, the process will lead to new knowledge and new priorities based on feedback received via deliberative consultation. 6) Finally, this new knowledge may then lead to amendments to environmental regulation. This theory of change essentially validates a fair process, which facilitates watershed protection (see Figure 4-2).

The evaluative questions used to assess the democratic rationale include:

- Have the Watershed Partnerships operated fairly?
- How often do partners meet?
- Have laws and regulations changed to mandate greater consultation because of this Program?
- What decision-making mechanisms do WPs use to make decisions?
    - How are decisions made?
    - Who has final say?
    - How genuinely deliberative are the actual decision-making processes?

- How effectively are decisions translated into action?

Figure 4-2: Theory of Change from a Democratic Rationale



Source: Author.

The Evaluation Plan below (Table 4-4) outlines how these evaluative questions were answered. The Plan outlines the specific activities performed by the Program, as well as the expected short- and long-term outcomes of the activities. The Plan also explains how the theory of change was assessed, by highlighting indicators for each of the outcomes. Data sources for each indicator are also included here.

Table 4-4: Evaluation Plan for a Democratic Theory of Change

WATERSHEDS ARE MANAGED AND PROTECTED EFFECTIVELY				
INPUTS	**ACTIVITIES**	**OUTCOMES**	**INDICATORS**	**DATA SOURCE**
Funding Personnel Equipment Manpower	Funding is made available Decisions/priorities about activities are being set Outreach/consultation is undertaken Ways to identify ways to foster consultation are recognized/identified Watershed protection regulations are enacted	Partners are meeting often Decisions are being made in a democratic fashion The Program is operating fairly Decision-making mechanisms are democratic in nature Decisions translated into action promptly Laws and regulations are being amended to mandate greater consultation	Partnership meetings are held and well attended Partnership decisions are made by consensus Management plans are updated regularly Formal deliberative processes are instigated and process of consultation is fair Local laws reflect changes that reflect community concerns	Coordinator interviews (4.5.2.1) Program-wide structured questionnaire (4.5.2.2) Coordinator interviews (4.5.2.3) Program-wide structured questionnaire (4.5.2.4) Archival research, Management plans, Legislative reports (4.5.2.5

Source: Author.

4.5.2.1 Partnership Meetings

For fair decisions to emerge, meetings will have to take place among partners. Ideally, all partners will attend meetings regularly in order to allow for the group to move forward with decisions (e.g., having enough present to make quorum) as well as set priorities after having heard from all partners involved. Information about the frequency of WP meetings as well as records of attendance was gathered via interviews with WP Coordinators.

4.5.2.2 Decision-Making Mechanisms

Decision-making mechanisms influence the way decisions can be made in any group effort. Decisions can be made by single vote by one designated member; voting among board of directors only; simple majority (51% minimum approval of all members); super majority vote (e.g., 80% minimum vote or 80% minimum approval of all members); and total consensus or unanimity among all members. How decisions are made between partners in the WPs was obtained via the Program-wide structured questionnaire.

4.5.2.3 Partnership Priorities

Management plans, or the tool with which partner priorities are set are one way to assure adherence to the group's overall mission. Without a plan, activities could happen haphazardly, without much care or

attention to whether they align with the common objectives of the partnership effort. Regularly updating partnership management plans is one way to make sure the process is fair and abides by policies supported by all partners. This data was collected from interviews with Coordinators.

4.5.2.4 Deliberative Outreach

Consultation strategies under a democratic rationale involve those mandated by law, including not only environmental disclosure with associated state and/or county public hearings, but also court mandates, social standoffs or protests, public opinion surveys, events that foster the exchange of cultural or scientific protocols, and focus groups. The use of these strategies under a democratic rationale would be in itself a demonstration of striving towards greater fairness, with respect and attention given to stakeholders' views. Information about the consultation strategies utilized by each individual partnership over the last five years was obtained via the Program-wide structured questionnaire.

4.5.2.5 Regulatory Change

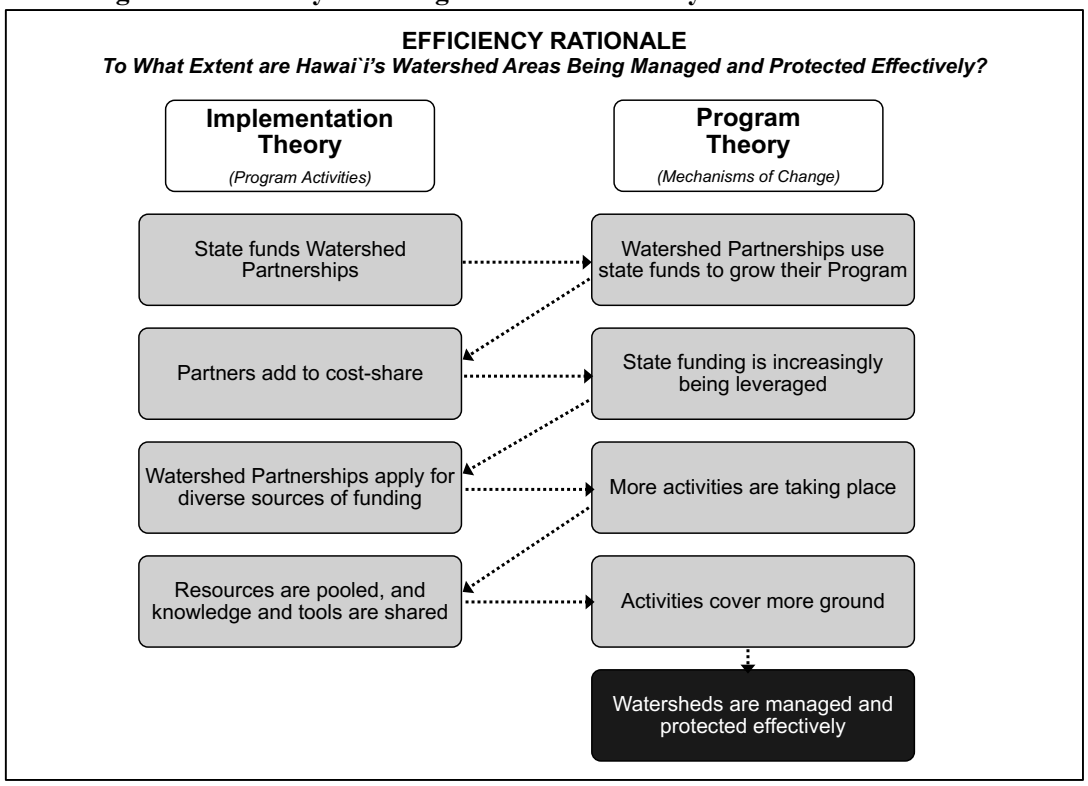
This assessment attempts to determine what laws or policies may have shifted or emerged in direct correlation with Program development, and see how such a change might impact a non-partner's ability to give feedback about Program activities. This assessment utilizes a mix of data gathering methods, including Coordinator interviews, and archival research.

4.5.3 Efficiency Model

"Efficiency Model" is used to include the related but different concept of "Effectiveness" in governmental functions. When partnerships work efficiently and effectively, they in turn increase the efficiency and effectiveness of public service delivery. They also facilitate local government access to funds for capital investment because of access to scaled economies; access to managerial, technical, or professional expertise; exposure to more flexible service provision; and shared risk. Bloomfield (2006) claims that through "innovative, long term public-private partnerships ... local governments can save money by applying private sector discipline to the delivery of public services" (p. 400). To assess the success of the

Program under an efficiency rationale, the appropriate theory of change will largely follow the economic impacts of the state funding allocated to the partnerships (see Figure 4-3). With the State funding, partnerships will be able to: 1) grow the Program utilizing the additional resources to reduce to the cost-share for the partners; 2) leverage these funds to apply for more funding (either federal or from private funds); and 3) increasingly conduct more activities and work across a broader area.

Figure 4-3: Theory of Change from an Efficiency/Effectiveness Rationale



Source: Author.

The evaluative questions used to assess the efficiency rationale will include:

- To what extent have partners pooled resources?
- Has State funding remained consistent?
- Have the Partners' cost-share increased over time?
- Have increasing sums of monies been invested?
- Have individual partnerships grown?
- Is State funding increasingly being leveraged?
- Is the State's investment showing signs of improvement?
- Have partnerships with the greatest share of State funding been able to conduct more activities?

The Evaluation Plan below (Table 4-5) outlines how these evaluative questions were answered. The Plan outlines the specific activities performed by the Program, as well as the expected short- and long-term outcomes of the activities. The Plan also explains how the theory of change was assessed, by highlighting indicators for each of the outcomes. Data sources for each indicator are also included here.

Table 4-5: Evaluation Plan for an Efficient Theory of Change

WATERSHEDS ARE MANAGED AND PROTECTED EFFECTIVELY				
INPUTS	**ACTIVITIES**	**OUTCOMES**	**INDICATORS**	**DATA SOURCE**
Funding Personnel Equipment Manpower	State funds are directed at partnership activities Partners add to cost-share of efforts Diversification of funding is occurring Resources are pooled and tools, knowledge and expertise are shared	Partners have pooled resources State funding remained consistent Individual partnerships have grown State funding is increasingly being leveraged Increasing sums of monies been invested into Program activities	Partner investments have grown over time State funding has not increased significantly over time Individual partnership staff has increased over time Non-state funding match has increased over time Partnerships with the greatest share of State funding been able to conduct more activities	Not available (4.5.3.1) Annual legislative reports (0) Coordinator interviews (4.5.3.2) Annual legislative Reports (4.5.3.3) Legislative reports and Program-wide structured questionnaire (4.5.3.4)

Source: Author.

4.5.3.1 Partner Investments

Since the Program partners include actors from various sectors, collecting data on total investments (including in-kind services, financial resources, manpower, or even space for storage or for public access) and/or on individual shares of services or investments can be difficult. Many partners in this partnership are private landowners or corporations whose expenditures are not publicly available. Furthermore, the State WPP does not collect data at this level of detail. Therefore, this data on partner investments were not available for this study. However, such data are acknowledged here as components of an ideal study, because the suggested measures would comprise an important indicator or set of indicators to include in any assessment focused on measuring efficient investment of public funds into a Program.

4.5.3.1 State Funding

If the watershed partnerships are effective at managing state investments, state resources (funding) should not be significantly increasing to fund these endeavors over time. Additionally, individual partnerships that receive the greatest share of funding should be able to conduct more activities than those receiving less. This assessment might tell us something about the quantity of activities undertaken by each partnership but tell us little about the quality of activities undertaken. Simply because one partnership is involved in more types of activities does not necessarily tell us whether they are successful at any of those, or whether they are having an actual impact. The assessment will hence utilize State funding data obtained through legislative reports to identify which partnerships have historically received the greatest share of state funding. The assessment also uses data obtained from the Program-wide structured questionnaire assessing perceived impacts of Program activities on the areas partnerships manage. This combination of inputs should provide a good idea of how efficiently the State has allocated resources.

4.5.3.2 Partnership Staff

With increased resources, partnerships should be able to grow their Program and hire more staff to conduct more activities over time. Again, staff size is not always commensurate with ability to be more effective, but in most instances investment in additional staff is related to growth of an organization.

4.5.3.3 Matching Funds

State funding allocated to Hawai‘i’s watershed partnerships is currently leveraged with an average 1:1 contribution from federal, county, and private sources. Data about State funding to individual partnerships over time has been difficult to obtain because the WPP has not consistently collected funding data yearly (though for some years, data on matching funds is presented in Legislative Reports) but attempts to see the growth of the matched funds garnered over time would indicate tremendous efficient use of public funds in the future.

4.5.3.4 Funding More Activities

Efficient use of State funding could be characterized as leading to the conducting of more activities being conducted. This assessment looks at the number of activities conducted by each WP (data gathered via the Program-wide structured questionnaire) as well as average annual funding for each (this data was obtained by searching the Annual DLNR/DOFAW Legislative Reports). Essentially, WPs who have received the greatest share of State funding should be able to carry out more activities than those receiving less.

4.5.4 Ecological Integrity

In the case of Hawai‘i’s WPs, public and private landowners are committed to a common goal of protecting forested watersheds for water recharge, conservation, and other ecosystem services through collaborative management. The primary tasks undertaken by the WPs focus on three main activities: feral ungulate control (hooved animals such as cattle, pigs, goats, sheep and deer which destroy forest vegetation, leaving grounds bare and soils exposed); invasive weed control (as these weeds tend to take over native forests and impact the forest’s ability to collect water); and wildfire management. While at this time, there are no studies directly linking groundcover changes to changes in stream flow for example, there are a number of studies determining the impact of feral ungulates on watershed areas (see for example Dunkell, Bruland, Evensen, & Litton, 2011; Cole & Litton, 2014). Feral ungulate impacts include soil compaction, decreased water infiltration into the soil, and increased overflow and erosion. Other studies have also shown how non-native (and faster growing) plants in Hawai‘i consume more water than native species (see for example Kagawa Aurora, Sack Lawren, Duarte Ka‘eo, & James Shelley, 2009). Essentially, the type of vegetation in a forest plays an important role in the hydrologic ecosystem of Hawai‘i’s watersheds: “by affecting the volume of rain water that reaches the ground surface, vegetation affects water supply. But because canopy interception of rainfall is affected in complex and competing ways by forest structure and ambient weather conditions, both of which vary at small and large scales, predicting the impacts of vegetation change is challenging” (Brauman, Freyberg, & Daily, 2010, p. 265).

An assessment coming from an ecological integrity rationale would focus on the degree to which the Program's activities are leading to tangible, measurable, on-the-ground improvements, and assuming that resource management activities will lead to long-term watershed enhancement. This assessment is rarely undertaken, or at least rarely done well as it presents significant challenges, as the following passage alludes to:

> In a perfect world, desired changes in natural resource conditions (such as recovering wildlife populations, cleaner water or enhanced forest stands) would always be used as a key measure for evaluating success in collaborative natural resource management. However, the time scale of resource response to management changes and the impact of variables beyond the influence of any collaborative venture make it difficult to link decisively the impact of group activities on environmental conditions (Kenney 2000; Perry & Ommer2003; Koontz & Thomas 2006, in Belton & Jackson-Smith, 2010, p. 251).

Other notable challenges to measuring long-term environmental improvements include 1) gathering suitable data that measures environmental outcomes; 2) allowing for long time horizons between the implementation of collaborative outputs and actual environmental change; and 3) designing research protocols that explain the effects of multiple interacting variables that shape environmental change (Koontz & Thomas, 2006). Because of these challenges, and also due to limited access to suitable indicators of environmental outcomes, many researchers and evaluators have focused more on readily-captured process and/or output measures, such as creation of management plans and/or policy changes than are actually assessing substantive environmental impacts (Belton & Jackson-Smith, 2010). Prevailing indicators used to measure environmental improvements have hence often focused on perceived effects on local conditions as measured through surveys. This analysis will attempt to include both types of indicators: pure environmental outcomes and perceived impact of activities on the environment, highlighting the challenges they both pose and suggesting ways to improve them.

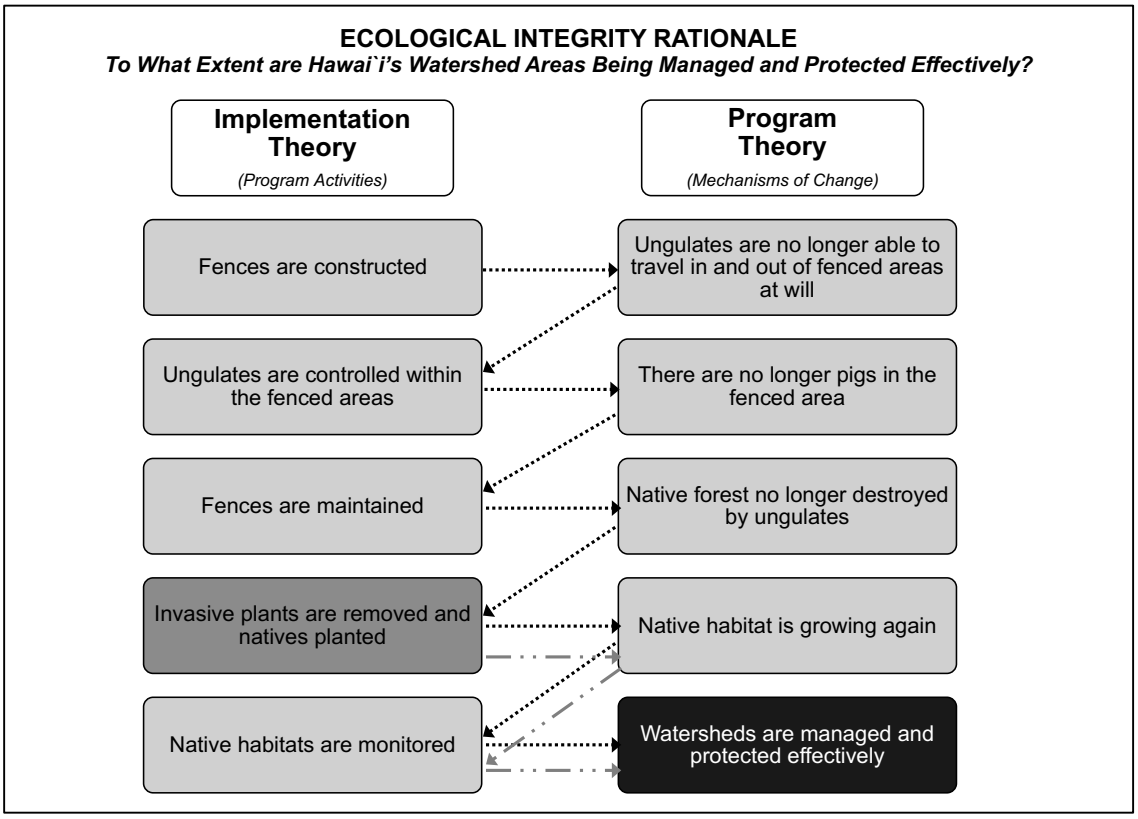
The theory of change used to assess the success of the Program through an ecological integrity perspective will focus on the impact of Program activities on local watershed areas (see Figure 4-4). The theory will

assume that State-funded fencing will ultimately lead to the following sequence of events: 1) confinement of destructive hooved animals (ungulates) within a fenced areas; 2) with active control of these fenced-in animals, they will eventually be eliminated; 3) combining ungulate management with active weed and invasive plant management will allow native ecosystems to recover within these fenced areas; and 4) with regular monitoring and maintenance of these fenced-in areas, native forests will no longer be threatened and will once again grow (and thrive) unimpeded.

The evaluative questions used to assess the Ecological Integrity rationale will include:

- Are WP's successfully managing invasive plants within the areas they oversee?
- Are WP's successfully managing the hooved animals within the areas they manage?
- What types of activities do individual WPs conduct?
- Of the activities the WPs perform, which ones do they believe are making the greatest progress?
- Of the activities WPs perform, what is the overall perception of their impacts?
- How many acres of new fences are being constructed over time?

Figure 4-4: Theories of Change from an Ecological Integrity Rationale



Source: Author.

- How many miles of existing fences are individual WPs maintaining?
- What are the issues most often raised by non-partner community members in the areas WPs manage?
- What is the WPs perception of their overall impact on addressing these issues?

The following Evaluation Plan (Table 4-6) outlines how these evaluative questions were answered. The Plan outlines the specific activities performed by the Program, as well as the expected short- and long-term outcomes of the activities. The Plan also explains how the theory of change was assessed, by highlighting indicators for each of the outcomes. Data sources for each indicator are also included here. Because of the challenges associated with gathering suitable data for measuring the ecological integrity of a watershed area

Table 4-6: Evaluation Plan for an Ecological Integrity Theory of Change

WATERSHEDS ARE MANAGED AND PROTECTED EFFECTIVELY				
INPUTS	**ACTIVITIES**	**OUTCOMES**	**INDICATORS**	**DATA SOURCE**
Funding Personnel Equipment Manpower	Resources/ Ecosystem monitoring	Activities are having an impact on overall watershed health	Activities are occurring and most at-risk and most pristine areas	Watershed Health Index (Kido, 2006) (4.5.4.1)
			Watershed Health improves over time	Photos courtesy of TNC (4.5.4.2)
			On-the ground improvements are noticeable over time	
	Invasive plants search and control	Invasive plants are being successfully managed	Increasing number of acres searched and controlled for invasive	Legislative reports (4.5.4.1)
	Fence construction (new)	Hooved animals are successfully being managed	Number of pigs or other hooved animals removed	Legislative reports (4.5.4.4)
	Ungulate Management (active)	Secured fenced areas	Increasing acreage protected from hooved animals	Legislative reports (4.5.4.4)
	Fence Maintenance	More miles of fences are being erected and maintained	Increasing miles of new fence constructed and maintained	Legislative Reports (4.5.4.5)
	Native species enhancement	Progress is being made in Program-targeted activities	Coordinator perceptions of overall impact of partnership activities on watershed health	Program-wide structured questionnaire (4.5.4.6)
	Infrastructure management and coordination	Activities are perceived as having an impact on overall watershed health	Coordinator perceptions of overall impact of partnership activities on watershed area (community issues)	Program-wide structured questionnaire (4.5.4.6)

Source: Author.

(because of timing, scope, unavailability of data, and attribution), this Plan utilizes a set of existing data collected by the DLNR/DOFAW, along with data collected via a structured questionnaire consisting of participant perceptions of the impact of their activities on the areas they manage.

4.5.4.1 Priority Areas and Watershed Health

Demonstrating that Program activities seek to focus on restoring native ecosystems that are most pristine as well as those that are at most-risk speaks to the effectiveness of the activities undertaken. An inventory of the health of Hawai‘i’s watersheds (across the State) was conducted in 2006 (Kido, 2006). Hawai‘i’s Watershed Health Index (WHI) is used to demonstrate where current partnerships are located in relation to the islands’ healthiest and least healthy watersheds. An assessment of whether the health of Hawai‘i’s watersheds has improved (especially in relation to Program activities) since 2006 would be desirable; however, at this time, the author has not heard of any plans to update the Index.

4.5.4.2 On-the-Ground Impacts

While void of quantifiable improvement metrics, an assessment of land cover change over time demonstrating pre-and post-fencing and other ungulate management activities in management areas demonstrate on-the-ground development. Pictures (both Google Earth and camera) are used to assess on the ground impacts of Program activities over time.

4.5.4.3 Invasive Species Removed and Controlled

To measure the increasing number of acres searched and controlled for invasive plant species, data on acres of lands upon which activities have been conducted is presented over time, with progress defined as increasing number of acres searched and controlled for invasive plant species over time. The data also includes percentage of acres controlled and searched for invasive species as it relates to the total number of acres managed by the Program. This data was obtained from DLNR/DOFAW Annual Legislative Reports for years 2014-2016.

4.5.4.4 Hooved Animals Controlled

Number of pigs or other hooved animals removed, as well increasing acreage protected from hooved animals is reported for all partnerships as suitable indicators of progress towards securing fences in order to manage the impact of hooved animals on native ecosystems. This data was retrieved from DLNR/DOFAW Annual Legislative Reports for years 2014-2016.

4.5.4.5 Fencing Built and Maintained

Increasing miles of new fence constructed and maintained serves as an indicator demonstrating, again, progression towards ultimate environmental Program goals. Fence construction is a weak indicator on its own, because many miles of fence may be truly needed in one area, but not particularly needed in other areas. Funding for fence construction is also allocated through State Capital Investment Project (CIP) appropriations, which must be distinguished from State operational funding allocated to partnerships each year. Fence construction is also sub-contracted to licensed State construction bidders. Fence maintenance and quality checking, on the other hand, is conducted by the partnerships.

4.5.4.6 Impact of Activities

A Program-wide structured questionnaire was administered to the WP coordinators to ask them about: 1) their perceptions of the impact of their partnership activities on the overall health of the watershed areas they manage; and 2) their perceptions of the impact of their partnership activities in addressing local community issues within the watershed areas they manage.

CHAPTER 5: MANAGING WATERSHEDS IN HAWAI‘I

Watershed partnerships in Hawai‘i have emerged over the last 25 years within an existing socio-cultural setting, a long history of resources management (both traditional and non-traditional), and with its own set of unique merits and challenges. This chapter situates watershed management in the Hawaiian Islands as part of Hawai‘i’s culture, its people, as well as an enduring commitment to a distinctive land ethic. The chapter begins with a discussion of the socio-cultural setting of the Hawaiian Islands, explaining how watershed planning in Hawai‘i is a unique and a culturally-tied endeavor that began long before modern notions of conservation surfaced (Section 5.1). The Chapter then describes the rise of modern conservation planning in Hawai‘i (Section 5.2), as well as the of emergence of Hawai‘i’s Watershed Partnerships (Section 5.3). Historical and current information about each individual partnership in this case study is provided in that section, as well as data about the types of agreements Hawai‘i’s partnerships have favored. Finally, the chapter ends with a review of various mechanisms that promote community engagement in environmental management efforts (Section 5.5).

5.1 Socio-Cultural Setting

In Hawai‘i, governance – or “[w]ho has power, who makes decisions, how other players make their voice heard and how account is rendered” (Institute on Governance, 2015) – reflects the rapid transformation of the islands’ land tenure system in the mid-nineteenth century. While under a traditional Hawaiian belief system, water and land were resources that could only be used, not owned (Kelly, 1980). This change to a private ownership regime has been described as “intended to wrest the land from Native Hawaiian control” (Kelly, 1980, p.71) and a calculated attempt of wealthy or politically connected foreigners to reap the benefits associated with owning land in Hawai‘i. Landownership in Hawai‘i is consequently key to one’s ability to govern and exert influence. In fact “there was never a ruling group in the history of Hawai‘i that did not base its power on land” (Cooper & Daws, 1990). Around 52 percent of land in Hawai‘i today is owned publicly, and about 22 percent of these lands rest solely in the hands of ten large landowners (DBEDT, 2015).

Table 5-1: State of Hawai‘i Landownership: Public versus Private

	Acres	Percent of Total
Public Federal Lands	530,123	12.9%
Public State of Hawai‘i Lands	1,565,538	38.1%
Public County Lands	34,142	0.8%
Largest Ten Private Landowners’ Holdings	894,245	21.7%
Remaining Privately-Owned Lands	1,088,340	26.5%
Total State Land Area	**4,112,388**	**100%**

Source: State of Hawai‘i, Department of Business, Economic Development & Tourism, 2015. Computation by Author.

The transition from communal land tenure to privatization in Hawai‘i resulted in a palpable exclusion of smaller landowner influence and of the landless in resource governance policies, primarily affecting some Native Hawaiian groups (for whom access to and authority over land and resources are vital components of their ability to perpetuate ancestral customs and lifestyles), as well as other socio-economically disadvantaged local residents and new immigrants.

5.1.1 Pre-European Hawaiian Society

Despite prevailing modern notions, the ethos of conservation and sustainability is nothing new, especially in Hawai‘i. The evolution of the pre-European contact Hawaiian socio-political and cultural order was established upon ecologically-based systems of knowledge that essentially articulated the underlying tenets of “modern” progressive conservation movements and ideologies. The settlement, social intensification, and subsequent expansion and diffusion of Hawai‘i’s early population over the course of many centuries on an isolated archipelago all testify to a legacy of sustainable land-use practices and technologies inherited from ancestors who were particularly familiar and intimately linked to the ecologies they encountered, cultivated, and inhabited.

Native Hawaiians have always been keen observers of nature, choosing to adapt their land use practices to suit local conditions rather than drastically altering the ecological and/or hydrologic conditions to fit pre-existing models of cultivation. Their arrival in Hawai‘i was accompanied by imported technologies and

landscapes necessary to gain a foothold in the new environment, as none of the plants that Polynesians depended upon for their staple starches were endemic to Hawai‘i (Bayman & Dye, 2013). A few examples of the primary sustainable innovations that allowed the Hawaiian population to thrive over the millennia include lo‘i kalo (terraced irrigated pond fields), loko i‘a (walled saltwater fish ponds), and wai loko (fresh water fish ponds). Irrigation for these endeavors was achieved by systematically diverting fresh water from natural streams for domestic and agricultural use, by means of artificial ditches called ‘auwai. These formed aqueduct networks through the wao, or deep forests, and used gravity to hydrate lower elevation crops before the water rejoined a stream to meet the ocean. ‘Auwai were typically walled structures made of rock, sculpted and embedded into the landscape to deliver water efficiently throughout the region for cooking, washing, and most significantly, crop cultivation (Derrickson et al., 2002; Costa-Pierce, 1987). The early Hawaiians also devised systematic dry-land cultivation expanses, organized by vegetation zones extending from the intermediate alluvial plains to the upland slopes of the islands' mountain ranges, by planting forests of trees, of which ‘ulu (the breadfruit tree) is a good example. The resulting canopy would allow for multi-cropping practices to develop in its resulting shadow, multiplying the potential calorie production in otherwise nutritionally bankrupt sections of the landscape (Kelly, 1989).

The long-term social isolation of the early Hawaiians (estimated to have lasted over 1,000 years) would end with European contact in the latter part of the 18th century (Dye & Pantaleo, 2010; Kirch, 1982) Although external forces would usher in disease-induced population collapse, alter pre-existing power structures, and gradually disrupt traditional relationships to the land and sea in the process, it would take a few decades to shift from a set of rival neighboring chiefdoms to a unified Kingdom. Moreover, this transition phase (1795-1850's) also involved a religious shift from polytheism (‘aikapu) to monotheism (Christianity), followed by the land tenure shift from communal to privatized land-use policies. Both engendered profound implications for related local human-environment relationships.

5.1.2 Transition Period

In the wake of the political unification of the Hawaiian Islands, King Kamehameha I appointed aliʻi nui or mōʻī (high chiefs) and konohiki (lower chiefs who were land managers) to monitor and coordinate the daily activities of the makaʻāinana (commoners) in efforts to maximize ecological productivity of each ahupuaʻa. The ahupuaʻa is a section of land, typically extending from mauka to makai (mountains to the sea), that provide, the natural and cultural resources necessary to accommodate the social and biological needs of its inhabitants. The ahupuaʻa land unit commonly comprises of variable elevations, shifting topographies, multiple micro-climates, production zones, and a variety of dietary, medicinal and utilitarian resources within its boundaries, all of which were traditionally accessible to each inhabitant of the district (Kelly, 1997a; Minerbi, 1999).

Drastic shifts in the political structure ensued with Kamehameha's unification of the islands. Land use was regulated by a single ruling dynastic lineage. However, the traditional system of land tenure allowing access to natural resources by all social classes within the ahupuaʻa was sustained. This system of land tenure may be viewed as a form of communal land governance, given that all commoners had both rights and also kuleana (responsibilities/obligations) linked to the ecology.

> As it was believed that all these wonderful resources were gifts from the gods, who provided the people with their sustenance, the resources of the land and the sea belonged to all people, and could not be claimed as privately owned by any one person or group. No individual could claim that they "owned" anything, even the chiefs did not "own privately" what the gods had created. Thus, control by the chiefs over the land and its resources was short-term management, not private ownership. (Kelly, 1997, p. 2)

Modern notions of sustainability and conservation were therefore fundamentally inscribed into every aspect of the native Hawaiian social universe through cultural and religious protocols and institutions. In a traditional Hawaiian context, we can link the productivity of the ʻāina (land) as a direct expression of the pono (balance) – or sometimes the imbalance (hewa) – between the forces of man and gods, between the

material and the spiritual realms of the kānaka maoli. The ʻāina and kai (land and sea), and all the biodiversity they engendered, were perceived as gifts from the gods. Appreciation for these bounties was displayed through mālama ʻāina (service and investment to the natural environment) to foster sustainable ecologies for future generations.[3] Thus, practices of conservation and sustainability (an aspect of mālama ʻāina), in this pre-European context may be perceived as a religious obligation, rather than a modern practice. In sum, the western notion of conservation was an integral aspect of the native Hawaiian social, cultural, spiritual, and political milieu. It was rooted in ancestral practices established long before the advent of conservation efforts associated with modernity.

5.1.3 Post-Transition Period

The death of Kamehameha the Great in 1819 enabled profound transformations in Hawaiʻi's social structure, beginning with abandonment of the ʻaikapu or religious system. Commerce and the free market had landed on Hawaiian shores during his reign, and they began to erode traditional relationships to the land and resources following his death. The ʻiliahi (sandalwood) trade depleted the forests in service of the marketplace by 1830 under both the great ruler and also his successor King Liholiho Kamehameha II. Ranchers and pastoralists also found a terrain friendly to their livelihood. Horses, cattle, deer, goats, and swine were imported, and these were not always controlled or contained by their owners.

> […] extensive and ongoing resource degradation was caused by the goats, cattle, pigs, and sheep introduced into Hawaiʻi by visiting sea captains before the end of the 18th century Initially, harvest of these animals was forbidden by King Kamehameha I. As a result, animal populations increased quickly, and both feral and semi-feral ungulates caused significant damage to native forests and grasslands. The end of the kapu system in 1819 allowed harvest of these animals, and the arrival of whaling ships increased the demand for cattle as provisions. However, livestock damage to native forests and to watersheds through overgrazing and erosion of steep slopes was recognized as a severe problem

[3] See Burrows, 1989 for examples of Hawaiian Conservation Values: Manaʻoʻiʻo (faith, respect for nature); Kapu and Noa (sacred and profane); ʻike (knowledge); ʻĀina (the living earth); Lōkahi (unity, balance, harmony); and Mālama (caring and stewardship).

> throughout the 19th century (Cox, 1992) and remains a problem today (Derrickson et al., 2002, p. 567).

Moreover, western contact redirected the energy from subsistence labor to commercial labor, which primarily benefitted foreigners. The ʻiliahi trade was then replaced by a short-lived whaling industry, which eventually gave way to industrial agricultural enabled by the Māhele in the mid-19th century. This further served to redefine the landscape as an economic commodity rather than a spiritual ecology, and would ultimately alienate the Native Hawaiian people from their ancestral homelands.

5.2 Early 20th-Century Forest Reserves

The degradation of native forests and concerns about available water supplies spurred the establishment of Hawaiʻi's forest reserves in the early 1900's (Woodcock, 2003) through Act 44. Leading these efforts were businessmen concerned with long-term provision of water: "After the overthrow of the queen in 1893 and annexation of the islands by the United States in 1903, the new territorial government, dominated by sugar interests, gave high priority to forest issues." (Woodcock, 2003, p. 625) Act 44 authorized the establishment of a board of Commissioners of Agriculture and Forestry to promote more effective protection of agriculture, horticulture, and forestry. Appointed commissioners to this board included Walter M. Giffard, Alfred W. Carter, James A. Dole, Jacob F. Brown, and Lorrin A. Thurston. By 1914, it was believed that about one-quarter of all land area in Hawaiʻi was in forest reserves. These lands, including most of the highly sloping lands and a majority of water recharge areas came to be referred to in Hawaiʻi as "the watershed" (Derrickson et al., 2002). The recognized need to protect mauka (upland) forests to provide enough water for both agriculture and also surrounding communities prompted a new era of public-private investment in forest protection and restoration.

5.2.1 Natural Area Reserves and Partnership Program

Hawaiʻi's Natural Area Reserves System (NARS) was established in 1970 through Hawaiʻi Revised Statute Chapter 195 to protect and preserve unique and representative examples of native ecosystems and geologic

formations. Since its establishment, 21 natural area reserves (NAR) on 123,810 acres of State lands across five islands have been set aside to be protected in perpetuity. The NARS paved the way for considerable protection of *public* lands in Hawai‘i. The language of the law specifically designated these protected areas to be in support of “communities:”

> **[§195-1] Findings and declaration of necessity.** The legislature finds and declares that (1) the State of Hawai‘i possesses unique natural resources, such as geological and volcanological features and distinctive marine and terrestrial plants and animals, many of which occur nowhere else in the world, that are highly vulnerable to loss by the growth of population and technology; (2) these unique natural assets should be protected and preserved, both for the enjoyment of future generations, and to provide base lines against which changes which are being made in the environments of Hawai‘i can be measured; (3) in order to accomplish these purposes the present system of preserves, sanctuaries and refuges must be strengthened, and additional areas of land and shoreline suitable for preservation should be set aside and administered solely and specifically for the aforesaid purposes; and (4) that a statewide natural area reserves system should be established to preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawai‘i. [L 1970, c 139, pt of §1] (HI Rev Stat § 195-1,”2012)(“HI Rev Stat § 195-1,” 2012).

In 1991, the Hawai‘i State Legislature enacted Act 326, establishing the Natural Area Partnership Program (NAPP), which specified that State funds be matched on a two-to-one basis for management of natural resources situated on *private* lands dedicated in perpetuity to conservation. A total of $250,000 was appropriated by the State in fiscal year (FY) 1991 and again in FY 1992 to that end. Rules for applications to the State from private and non-profit organizations were outlined in 1992 and included the submission of a preliminary proposal, a NARS Commission review, and detailed management plan preparation. The Nature Conservancy (TNC) submitted a total of six proposals to the State as soon as the Law was enacted; of these, four were selected by the NARS Commission, and three actually funded in FY 1992. The NAPP provides support for a range of management activities, and the State’s Department of Land and Natural

Resources (DLNR)'s Division of Forestry and Wildlife (DOFAW) staff administer the Program. The landowners and supporting managers carry out all on-the-ground activities. Today, TNC manages seven of the now-established eight NAPP natural area preserves. [4] The NAPP now includes more than 32,520 acres of private lands protected in perpetuity.

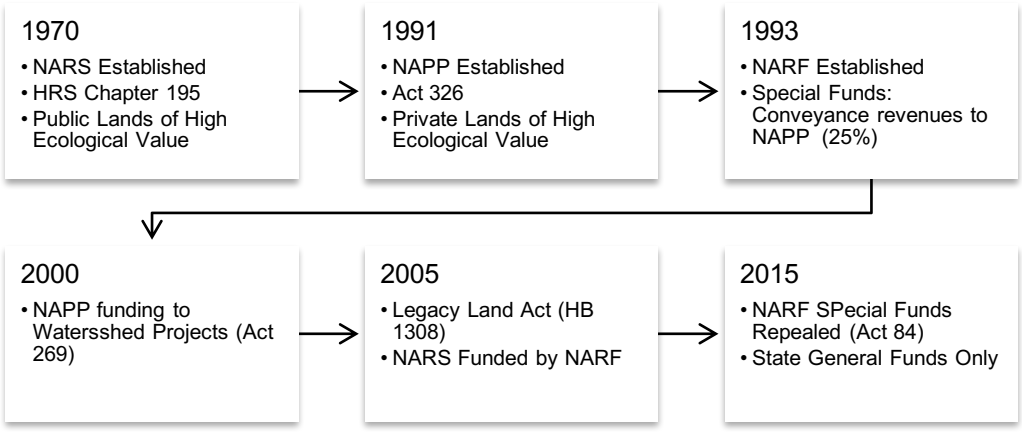
Since 1970 the NARS Program was funded with direct state appropriations (which fluctuated greatly). NARS' annual operating and personnel budget peaked at $2.5 million in 1991 and steadily declined to $1.17 million in FY 2001. In 1993 (HRS 247), the legislature decided a portion (25%) of the State's Conveyance Tax (a tax that is levied each time real estate property is bought or sold) would be directed to a Natural Area Reserves Fund (NARF). This dedicated permanent source of state funding would provide matching funds on a two-to-one basis with private funds for the management of natural resources on private lands permanently dedicated to conservation.

In 2000, the NAPP expanded to include year-to-year funding for several watershed projects via Act 269. This move to include large watershed projects outside of NAPP (but still through proposed partnerships) allowed for pursuing larger Federal grants. In 2005, the State passed the Legacy Land Act (House Bill 1308 CD1), which added the NARS to the list of Programs receiving funds from the NARF (utilizing proceeds from the Conveyance tax) to assist NARF (and other programs) in protecting critical habitat, endangered species and valuable cultural resources. Unfortunately, after a number of years of reliable funding, the Hawai‘i State Legislature repealed the conveyance tax special fund revenue in 2015 (through Act 84) and returned funding for this Program to line items in the State's General Funds budget. The Legacy Land Fund is still alive and funded by 10% of the Conveyance tax. The NARF was allotted $2.2 million in 2015 and $2.5 million in 2016. The NARS and the NAPP are placed within the Department of Land and Natural

[4] The Nature Conservancy owns three of the protected parcels, and share management responsibilities with the landowners of the other four preserves. One preserve is owned and managed by a private landowner on its own in West Maui.

Resources (DLNR) and currently (2016, 2017) receive funding from the State General Fund (line items LNR 402 and LNR 407).

Figure 5-1: Development of Watershed Management Funding



Source: Author.

5.2.2 Watershed Partnership Program

The Watershed Partnership Program (WPP) is a Hawai‘i State DLNR/DOFAW Program established in 2003 to provide technical and financial support for implementation of watershed management plans across the Hawaiian Islands. The WPP was funded by the Natural Area Reserve Special Fund, established by HRS §195-9 until 2015, when it was repealed. As discussed above, these funds came from a portion of the conveyance tax, but now from a direct line item in the DLNR's overall annual budget. The WPP is staffed by one Planner. The WPP now distributes funding to Hawai‘i's watershed partnerships on a competitive bid basis. Each year, WPs must apply for funding, and justify activity costs in order to receive State funding from the DLNR/DOFAW's WPP.

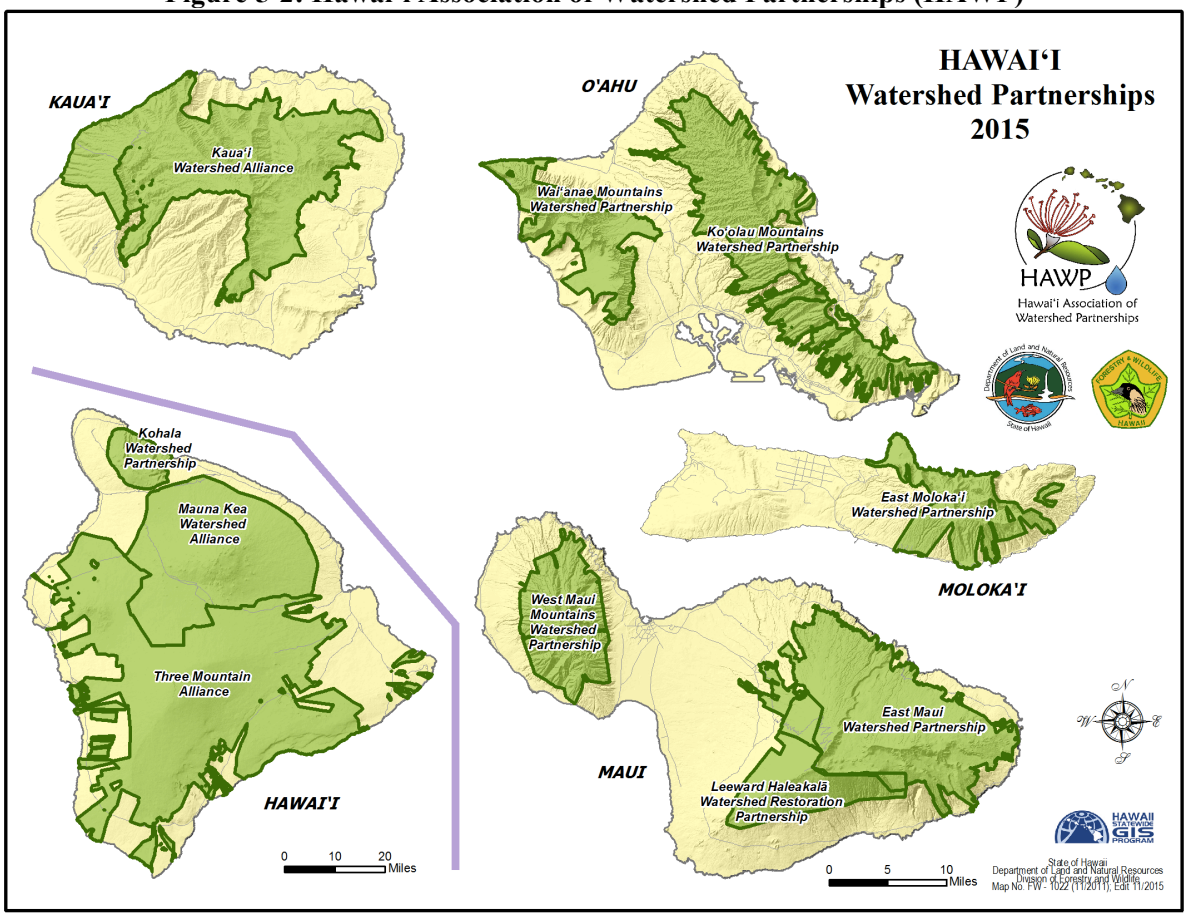
5.3 Hawai‘i Association of Watershed Partnerships

The Hawai‘i Association of Watershed Partnerships (HAWP) was created in 2003, on the 100th anniversary of Hawai‘i's Forest Reserve System under then Governor Linda Lingle. HAWP is a multi-sector collaborative NRM organization made up of ten individual Watershed Partnerships and involving more

than 100 partnering institutions/stakeholders from the public, private, and non-profit sectors across the State of Hawai‘i. All individual Watershed Partnerships in HAWP are formed of one or two large (national) non-profit partners (The Nature Conservancy is involved in most); of State, County and/or Federal partners from the public sector; and of at least one large area landowner. None of the partnerships have formally partnered with any local community groups or local area residents who are not landowners within the WP management areas. The HAWP is not a formal partnership, but an informal entity convened by signed agreement consisting of a Memorandum of Understanding (MOU) or Memorandum of Agreement (MOA) by “willing landholding partners.” The Association MOU suggests that the partners “agree to participate in cooperative fundraising, building public and political support and capacity building for island based mauka watershed partnerships” (see Section 5.4 for details on the Association’s agreement as well as individual agreements with members/partners).

HAWP’s ten partnerships (also called alliances) currently extend across five islands: Kaua‘i (x 1); O‘ahu (x 2); Moloka‘i (x 1); Maui (x 3); and Hawai‘i Island (x 3). These partnerships are comprised of voluntary collaborations among public and private partners to protect more than 2.2 million acres of vital forested watershed lands (see Figure 5-2). The Association and its individual partnerships are partially funded by the Hawai‘i State DLNR Division of Forestry and Wildlife (DOFAW) Watershed Partnerships Program (WPP), which provides technical and financial support for the implementation of HAWP’s Watershed Management Plans. Conservation activities conducted by the Watershed Partnerships activities include: ungulate control through fencing and targeted hunting practices; eradication of invasive weeds and plants; reforestation and vegetation of upland areas and other habitats critical to the recharge and protection of water supply; and suppression and management of wild land fires resulting in the loss of forests.

Figure 5-2: Hawai‘i Association of Watershed Partnerships (HAWP)

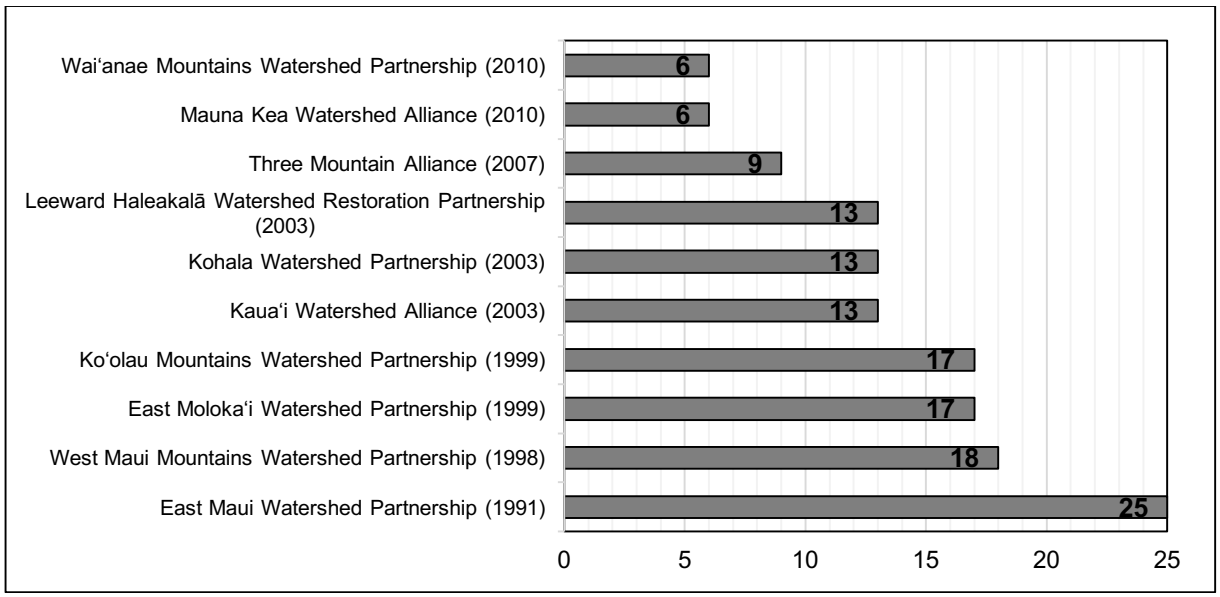


Source: State of Hawai‘i, Department of Business, Economic Development & Tourism, 2016.

The first watershed partnership, the East Maui Watershed Partnership (EMWP), was established in 1991, followed by the West Maui Mountains Watershed Partnership (WMMWP) in 1998. Two watershed partnerships were established in 1999: the East Moloka‘i Watershed Partnership (EMoWP) and the Ko‘olau Mountains Watershed Partnership (KMWP). In 2003, three new partnerships emerged: the Kaua‘i Watershed Alliance (KWA), the Kohala Watershed Partnership (KWP), and the Leeward Haleakalā Watershed Restoration Partnership (LHWRP). Three Mountain Alliance (TMA) was established in 2007, followed by the last two partnerships in 2010 – the Mauna Kea Watershed Alliance (MKWA) and the Wai‘anae Mountains Watershed Partnership. Additionally, while no longer active, the Lāna‘i Forest and Watershed Partnership (LFWP) was established in 2001, but due to the unique ownership of the island (the

island is largely owned by one private investor), the conservation activities on the Island are no longer spearheaded by the LFWP.

Figure 5-3: Partnership Ages (2016)



Source: Watershed Partnership Management Plans.

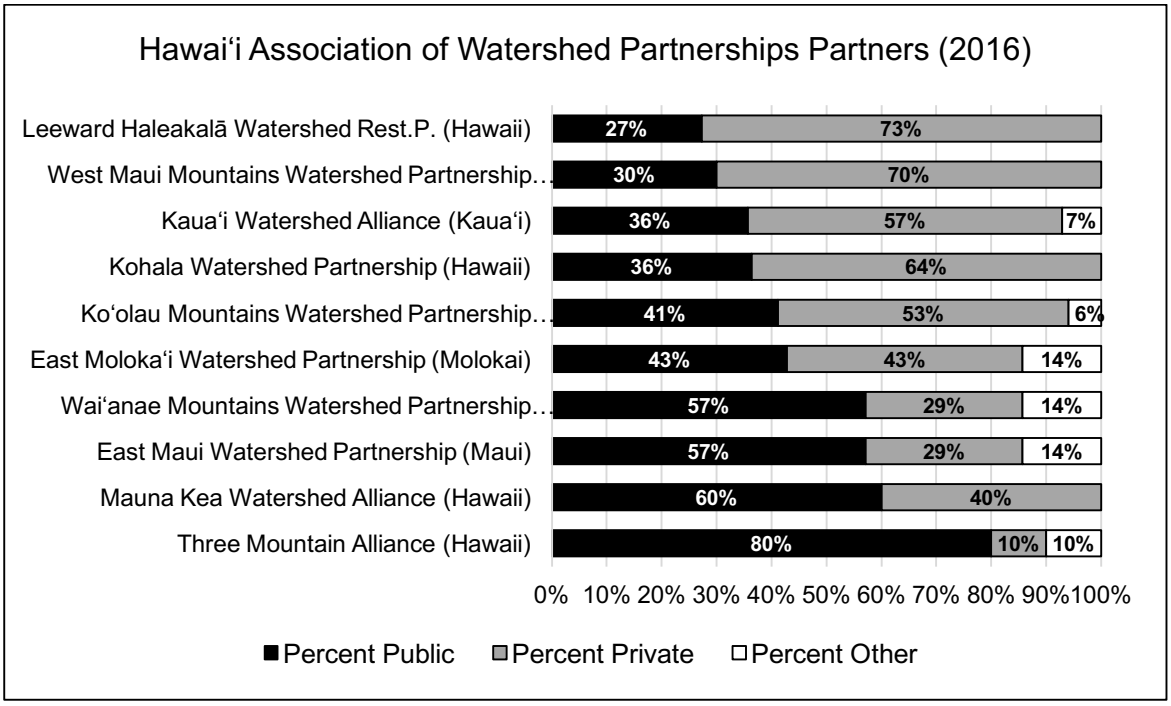
The great majority of HAWP's Partnerships have little representation from individual, non-landholding community members near the localities they manage. Stretches of lands within the managed areas largely consist of existing forest reserves and/or other conservation areas. Figure 5-4, below shows Partnership representation by sector, with public landowners representing 53% of all partners. The private partners are generally very large landowners who historically have been involved in ranching or food agriculture. Public partners often include federal agencies such as the U.S. Fish and Wildlife Service (USFWS), U.S. Department of Agriculture (USDA), or the National Park Service (NPS), as well as county boards of water supply that may not in fact own lands in the management area, but are vested in water nonetheless. "Other" partners are typically non-profit NGOs, such as the National TNC. Smaller NGOs are rarely partners in the partnerships as they are typically not landowners in the areas managed.

Nearly half of lands in the State of Hawai'i are currently owned by private landowners, with the State of Hawai'i owning a share of 38% and the federal government owning 14%. State representation in HAWP is

at 25% of all partners involved. These figures do not, it should be noted, capture the number of acreage actually managed by each partner, to give an accurate assessment of the percentage of acreage under public management versus private (see

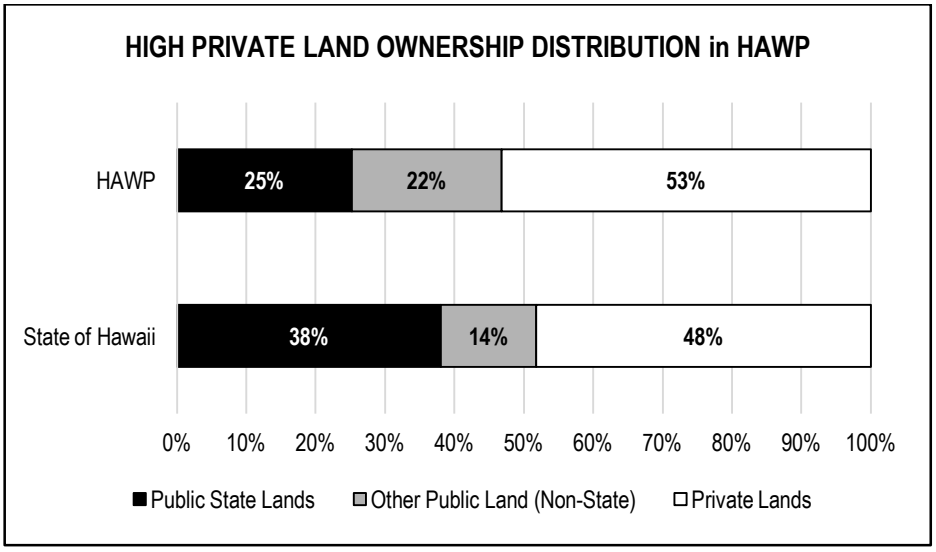
Figure 5-5).

Figure 5-4: Percent Private and Public Partners (2016)



Source: Compiled by Author, from Coordinator interviews.

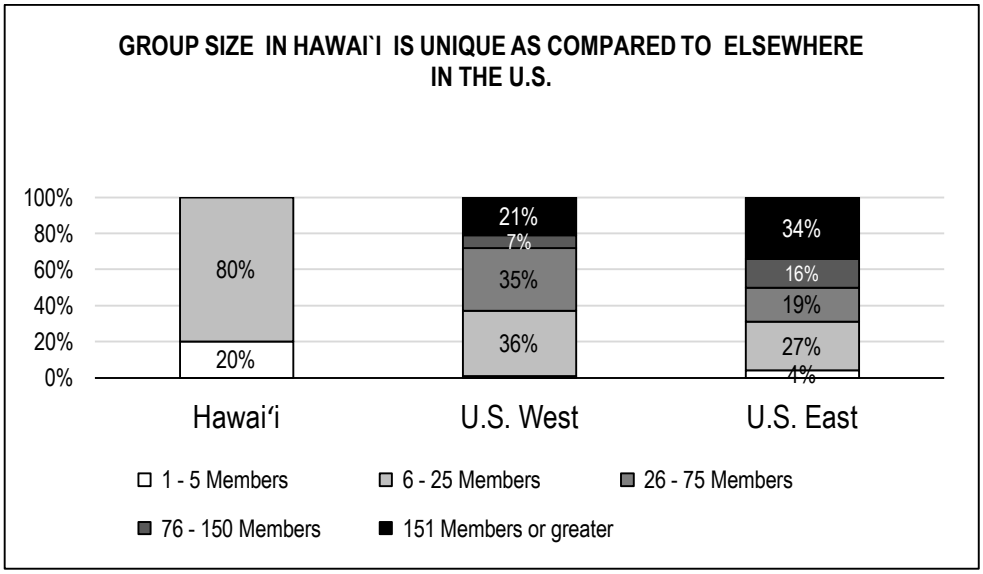
Figure 5-5: Unique Landownership Distribution



Source: State ownership data from State of Hawai'i, Department of Business, Economic Development & Tourism, 2015. HAWP data from Coordinator interviews. Analysis by Author.

Hawai‘i’s partnerships are unique, as compared to watershed partnerships in other localities across the U.S., when looking at partnership size/membership. U.S partnerships east of the Dakotas, Nebraska, Kansas, Oklahoma, and Texas are largest, with 34% composed of more than 151 members each. Western U.S. Partnerships vary somewhat more, but are certainly larger in size than Hawai‘i’s partnerships (see Figure 5-6). Because the majority of lands within Hawai‘i’s watershed protected area is located in non-residential and often inaccessible areas, along with the fact that membership into the partnership is in most instances restricted to landholding partners, it comes as no surprise that group membership is lower in Hawai‘i than in other areas of the United States. Hawai‘i’s partnerships are much more fundamentally oligarchic and that certainly bears upon the level participation.

Figure 5-6: Unique Group Size



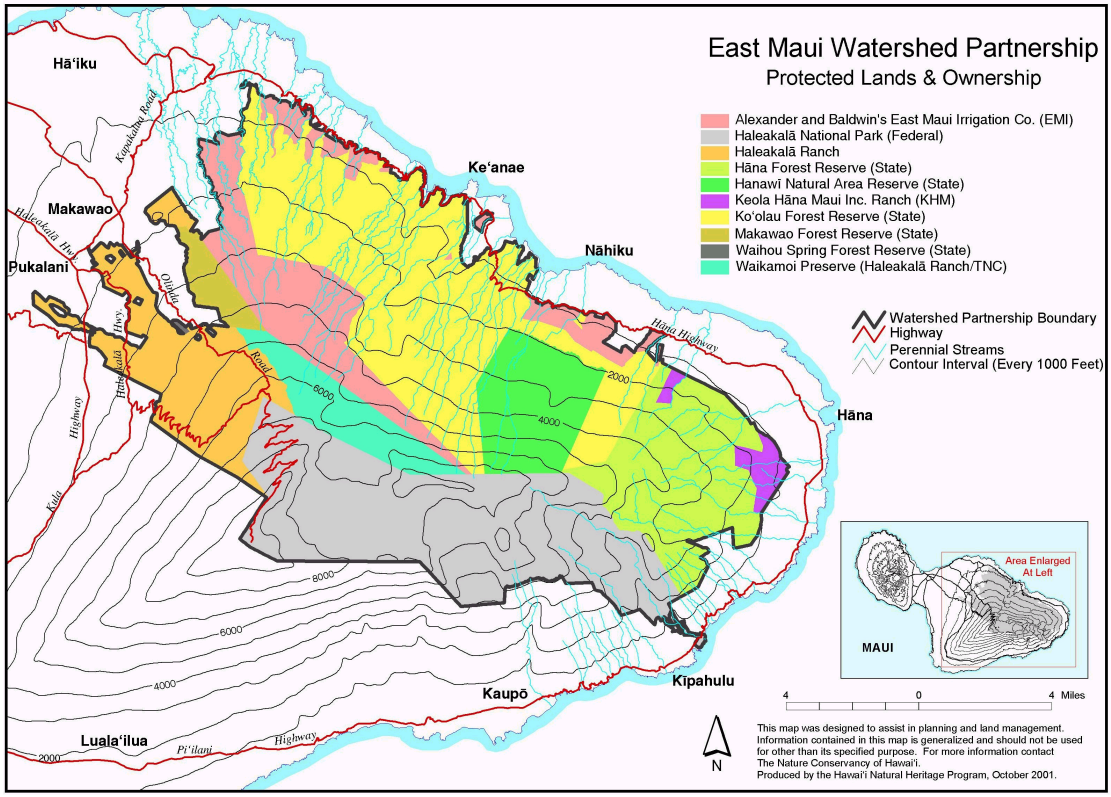
Source: Clark, B. T., Burkardt, N., & King, D. (2005). Watershed Management and Organizational Dynamics: Nationwide Findings and Regional Variation. *Environmental Management*, *36*(2), 297–310. Hawai‘i data from Coordinator interviews. Analysis by Author.

5.3.1 East Maui Watershed Partnership (EMWP)

The EMWP was the first Watershed Partnership established in in Hawai‘i in 1991. The EMWP’s management area encompasses approximately 119,504 acres of land in a very rugged, moist, and relatively rural eastern part of Maui (see map Figure 5-7). The WP’s 2009 Management Plan outlines its mission:

We the landowners of the forested watershed area of East Maui participate together to protect East Maui's native rainforest and primary water source in perpetuity. We do this to ensure the goods and services of the watershed are provided to the island's communities and the continued health of East Maui's unique native plants and animals. We pledge to do this with fiscal responsibility, efficient completion of work promised, and proper education and reporting. (p.7).

Figure 5-7: EMWP Map, East Maui



Source: EMWP Management Plan. (2007).

The EMWP was established with six landholding partners, which is still the case today (see Table 5-2). The WP also has four non-voting yet collaborating "Associate Partners." Since its formation, two associate partners have been added: The United States Department of Agriculture (USDA)'s Natural Resources Conservation Services (NRCS) agency, as well as the U.S. Fish and Wildlife Service (USFWS). The EMWP staff consists of a Program Coordinator, a NRM Manager, three field assistants, a human resources assistant, and a public outreach leader (part-time) and field data assistant (total of eight, of which three are part-time employees).

Table 5-2: EMWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
The Nature Conservancy	NGO-National	Kīpahulu ‘’Ohana	NGO-Local
East Maui Irrigation	Private	USDA Natural Resource Conservation Services	Public-Federal
Haleakalā Ranch Company	Private	US Fish & Wildlife Service	Public-Federal
Haleakalā National Park	Public- Federal	Pacific Cooperative Studies Unit	Public-State
State DLNR Division of Forestry and Wildlife	Public- State		
County of Maui – Department of Water Supply	Public- County		

Source: Compiled by Author, from Coordinator interview.

Likely because of the numbers of years it has been established, along with adequate staff, the EMWP performs a great number of activities (see Table 5-3). The majority of management issues encountered within the East Maui region involve pig as well as invasive species search and control. Hence, most of the management emphasis in the watershed involves ground resource management – such as invasive plant removal, fence building, and fence maintenance – to protect upper area ecosystems from the spread of invasive species.

Table 5-3: EMWP Activities

Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	
Fencing	X
TOTAL	**8**

Source: Compiled by Author, from Program-wide structured questionnaire.

As with most WPs in Hawai‘i, the EMWP receives its funding though an administrative unit, located at the University of Hawai‘i at Mānoa (UHM), through its Pacific Cooperative Studies Unit (PCSU). The PCSU then hires EMWP staff through the Research Corporation at the University of Hawai‘i (RCUH). Some funding, such as federal or non-profit funding, is also received through a non-profit. Funding from DLNR in recent years has represented around 20 percent of the EMWP’s total operating budget. Other significant funding is received from the Maui Department of Water Supply.

One of the first projects undertaken by WMWP included a 6,000-acre fencing project with national non-profit The Nature Conservancy (TNC). This was for a total of 12,000 acres in a unit in the upper reaches of the watershed in 1999-2000; a project that carried on until 2004. In 2016, EMWP leadership reported zero ungulate activity within this unit. To this day, EMWP and TNC each manage half of the now completed fenced-in unit. While the entire EMWP management area consists of a total of over 119,500 acres (as seen in Figure 5-7), the WP actually "actively" manages only about 10,000 acres at this moment.

EMWP activities have not historically included native planting, though some peripheral native planting is possibly going to happen in the near future. For now, along with focusing on ungulate management within the fenced areas, the EMWP has been primarily engaging in invasive plant removal. Growth of African Tulip is a major issue in the East Maui Region, though most emphasis has been placed on the removal of Himalayan Ginger. Strawberry Guava, another significant invasive species pervasive throughout the landscape is going to be an important plant to eradicate in future years as well. The difficulties associated with managing the rampant invasive plants and trees are largely due to the rugged terrains of the East Maui region, with most activities having to be conducted by helicopter access only. Flights over the watershed area are also necessary in order to survey and detect the expanse of the invasive plants.

A dedicated Outreach and Education (E&O) staff has been working at EMWP since 2003. The first E&O coordinator was brought on in 2003 to engage the local community and create better community-partnership understanding. The E&O Program at the EMWP focuses on communicating the importance of healthy watershed to (non-partner) community members, and also focuses on service learning. Interaction with community members who are not partners or members of the EMWP occurs through different events. The E&O Program was born in direct response to opposition from the region's hunting community, who had perceived EMWP activities (particularly the upper watershed fencing activities) as infringing on their ability to access public hunting areas. As seen in Figure 5-7, the State of Hawai‘i owns much of the lands in the EMWP area (the Hāna Forest Reserve, the Hanawī Natural Area Reserve, the Ko‘olau Forest Reserve,

the Makawao Forest Reserve, and the Waihou Forest Reserve). The state-protected lands within the EMWP are all administered under the State of Hawai‘i’s DLNR. Under DLNR rules, all public lands are mandated to permit recreational activities. This means that while on one hand, the state is working to manage ungulates (hooved animals such as pigs and deer) through fencing, it must also provide opportunities (and pigs) for hunting.

The fencing project initiated in 1999-2000 was fortunately high up in the watershed, and inaccessible to most because it would take about a day’s hike to get there (and another day to get back). It is illegal to camp there. Hunters needed to understand that while zero (ungulate) tolerance inside a fenced unit was a guiding principle, not the whole 100,000 acres was inaccessible to them, only portions that were fully fenced in (so far only 12,000 acres). Some local community members were actually flown over the area by helicopter before the fencing project was started (at the time of the preparation of a draft environmental assessment that was needed to construct the fence) to show them the proposed fence would not be located on prime hunting grounds but rather on inaccessible high elevation areas with far fewer pigs than other areas in which they were accustomed to hunting. Once hunters understood the fencing undergone was in no way impeding access to their current hunting grounds, WP Partner East Maui Irrigation (EMI) and DLNR provided an easement to the lower part of the reserve for access (i.e., people can get a waiver and sign a liability waiver to go in the lower areas of the protected watershed).

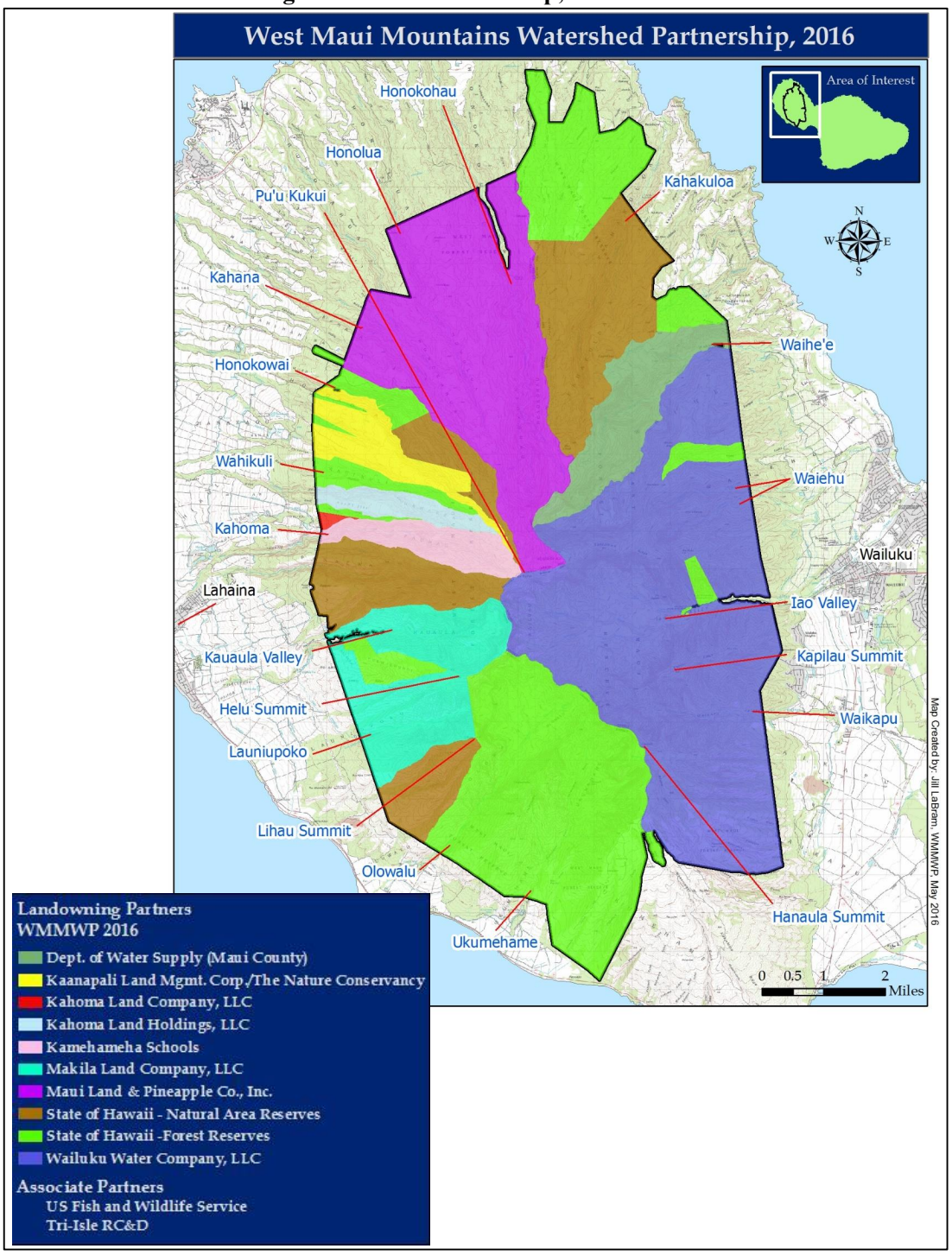
The EMWP partners meet quarterly, though WP management reports some partners are more active than others. Even if not every partner is able to be there in person, they get a report quarterly.

5.3.2 West Maui Mountains Watershed Partnership (WMMWP)

The WMMWP was established in 1998 and its management area spans across 47,321 acres within West Maui (see Figure 5-8). Within that footprint, the WMMWP actively manages around 29,000 acres (more than 60%) of the watershed area. While not primary manager on some of those lands, the WMMP supports

landowners in managing area reserves by providing manpower and some resources such as tools or equipment.

Figure 5-8: WMMWP Map, West Maui



Source: WMMWP Website, 2016. http://www.westmauiwatershed.org/about-wmmwp/maps-&-information/maps. Retrieved on July 31, 2017.

WMMWP has a diversified membership comprised of nine landowners and four supporting partners. The WMMWP also receives its funding though the administrative unit or fiscal agent located at the University of Hawai‘i at Mānoa (PCSU). Additional funding is also received through a non-profit fiscal conduit for some grants.

Membership into WMMWP is determined based on ownership within the management area, generally devolving around the State Conservation district boundary. By and large, 100% of owners within that area are represented on the WMMWP. The partnership is a voluntary partnership. Partners do not have to provide resources but they agree to be part of the vision. Decisions (for example regarding changes to the Management Plan) are arrived at by full consensus of all partners. Quarterly meetings are held each year, and decisions made by an Executive committee of four members. There is generally much agreement and congruence between WMMWP partners. Partners involve six local area private landowners, a national NGO (TNC), as well as State and County partners (see Table 5-4).

Table 5-4: WMMWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
The Nature Conservancy of Hawai'i	NGO- National	Tri-Isle Resource Conservation & Dev. Council	NGO-Local
Ka'anapali Land Management Corp.	Private	U.S. Fish and Wildlife Service	Public-Federal
Kahoma Land Company L.L.C.	Private	Research Corporation of the University of Hawai'i	Public-State
Kamehameha Schools	Private	Pacific Cooperative Studies Unit at UH Mānoa	Public-State
Makila Land Company, L.L.C.	Private		
Maui Land & Pineapple Company, Inc.	Private		
Wailuku Water Company, L.L.C.	Private		
State DLNR Division of Forestry and Wildlife	Public-State		
County of Maui, Department of Water Supply	Public-County		

Source: Compiled by Author, from Coordinator interview.

The WMMWP currently has a staff of ten paid employees, of which one is half time. The employees consist of one Partnership Coordinator, one Program Assistant, an Administrative Assistant, a Technician, a Data/Field Technician, a field crew, and some field assistants. This partnership has had a staff of up to 13

in the past. They also engage interns through AmeriCorps.[5] WMMWP conducts a significant amount of outreach, leads interpretive hikes, and provides volunteer opportunities. It has an approved volunteer Program through the University of Hawai‘i with a focus on stewardship.

Internships lasting half a year, and with a stipend, are offered through AmeriCorps. The volunteers are not necessarily students; they can be local area residents wanting to be more involved in conservation work. The benefit of these internships is that they can be a cost match on some grants when salaries are not approved as part of the funding but time can count toward the required funding match (most federal or private grants generally require a match).

The WMMWP attracts around 100-150 public volunteers a year. The volunteers typically help with strawberry Guava removal along the Waihe‘e Ridge. Volunteers are taught about the place and about effective conservation approaches. Training is conducted on-site with a hands-on five-to-one ratio of volunteers to WMMWP staff so everyone is safe. Volunteers must sign a landowner waiver, as well as a UH and medical waiver, prior to participating. The volunteer Program has been challenging as there are limited accessible areas in the management area, and counting on volunteers, who are not always reliable, can be difficult. The WMMWP is therefore using different strategies to reach out to area residents, including publicly advertising open events (website, Facebook or mailing to a list) a few times a year, as well as organizing events with school groups, civic groups, hula hālau (traditional schools of hula instruction), high school senior projects, roller girls etc. They attempt to strategically engage the community. For example, a local hula hālau contacted the WMMWP to inquire about access to native forests in the area to collect materials for adornments. In turn, members would help steward the land. Hālau members would otherwise

[5] AmeriCorps is a voluntary civil society Program founded in 1993 that is supported by the U.S. federal government, foundations, corporations, and other donors engaging adults in public service work with a goal of "helping others and meeting critical needs in the community." https://www.nationalservice.gov/programs/americorps

have to purchase their materials from the Big Island. These are the types of relationship WMMWP wants to continue to develop.

WMMWP attributes its success to having a larger staff, but also to the cohesion resulting from partnership members all wanting to "be on the same page.". There is a real connection of landowners to local water sources in West Maui. All landowners have their own water companies. Members understand how the forest helps sustain water resources, so they are intimately connected to the resource. They are all aware of how the forest works. Some landowners are part of NAR and all agree to share in-kind services or resources. Those who may not have the resources let others store things on their lands, etc.

The partnership also has not suffered from many of the traditional use conflicts with which other partnerships have had to grapple over the years. For example, in East Maui, tensions with local hunters heated up in the early years of the partnership, but game species were not introduced to West Maui until 1960-70 so there has been much less of a tradition of hunting in that region. Also, the periphery around Maui's west side was historically inaccessible as much of the lands there were agri-business. Relative to other places, there is relatively less community connection to landscape and practically no long-time tradition of hunting in the area. Access is also limited because the topography is very steep. Thus, historical scarcity of animals, lack of a hunting tradition, and difficult terrain all contributed to limited human presence.

According the Coordinator, the WMMWP Management Plan (from 1999) is still pertinent. Once the management plan is approved by the partners, they try to act within it. The WMMWP Executive Committee helps to guide decisions on new issues as they come up. If the matter is thought to be significant, it can be taken up by the general partnership, with consensus as the goal. A majority vote will take place if it is a difficult issue.

DLNR funding for the WMMWP has historically represented about one third of the Partnership's overall budge but fluctuates when additional capital improvement project (CIP) monies are disbursed in addition to regular Program funding for actual fence construction in the area. The WMMWP activities focus on passive restoration, where the emphasis is on removing invasive species that have overgrown the local landscape. The work involves first building a fence, then removing hooved animals to limit disturbances, and then also removing the weeds. Fence maintenance is also a large part of the work, as fences need to be checked for breaks or holes. Sometimes trees collapse on fences, and sometimes vegetation overgrows and lifts fences up. Animals can go in and exploit such gaps. Whenever there is a storm, staff needs to go check.

Table 5-5: WMMWP Activities

Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	X
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	X
Fencing	X
TOTAL	**10**

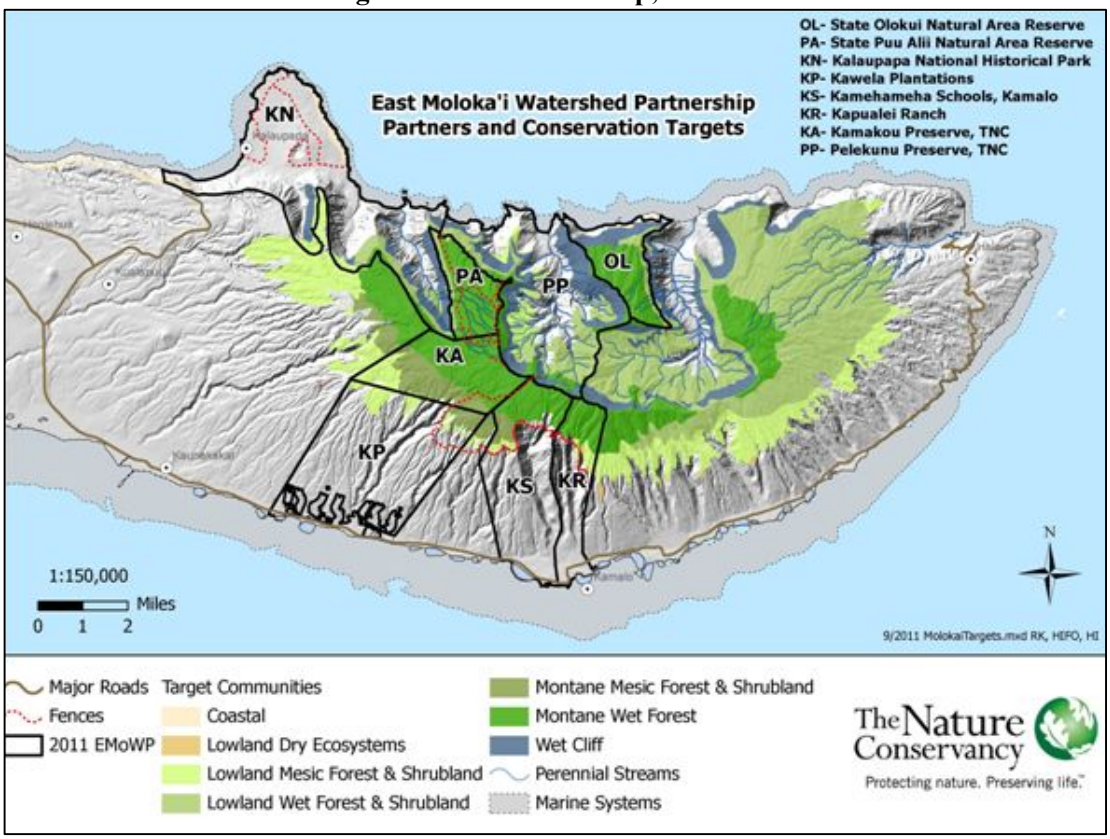
Source: Compiled by Author, from Program-wide structured questionnaire.

5.3.3 East Moloka'i Watershed Partnership (EMoWP)

The EMoWP was established in 1999 and focuses on the protection of more than 41,668 acres (see map in Figure 5-7). The EMoWP was one of the earlier WPs formed in Hawai'i (the second, after EMWP). EMoWP management or staff did not reply to my email queries to participate in an interview or the electronic questionnaire to share information on the specific nature of activities or milestones achieved. However, a list of partners was obtained from the management plan found online, and data on staff counts, and number of activities was obtained by TNC staff. The EMoWP conducts many activities (10), including the management of a number of feral ungulates, including pigs, goats, and deer, as well as invasive weed

management. According to the EMoWP Management Plan, fire is also one of the major threat to the watershed and forest they manage.

Figure 5-9: EMoWP Map, Moloka'i



Source: EMoWP Website. The Nature Conservancy. East Moloka'i Watershed Partnership Partners and Conservation Targets. https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/hawaii/howwework/east-Moloka'i-watershed-partnership.xml. Retrieved on July 31, 2017.

Landowning members (six) of EMoWP do not include any county-level representatives or local area non-profit organizations, although both are listed as the partnership's "associate partners" (see Table 5-6).

Table 5-6: EMoWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
The Nature Conservancy	NGO-National	Ke Aupuni Lōkahi, Enterprise Governance Board	NGO-Local
Kamehameha Schools Bishop Estate	Private	USDA Natural Resource Conservation Services	Public-Federal
Kapualei Ranch	Private	US Fish & Wildlife Service	Public-Federal
Kawela Plantation Homeowners Association	Private	US Geological Services	Public-Federal
NPS, Kalaupapa National Historical Park	Public-Federal	US EPA	Public-Federal
State DLNR Division of Forestry and Wildlife	Public-State	State Department of Health	Public-State
		Moloka'i Plant Extinction Prevention MoPEP	Public-State
		Moloka'i/Lāna'i Soil & Water Conservation District	Public-State
		Maui County	Public-County

Source: Compiled by Author, from WMoWP Website.

The EMoWP employs a total of 6 staff, including the Coordinator who is a TNC full-time employee. The EMoWP Management Plan (2008-2015) reports that conducting community outreach and making community partners is essential for their island, for several reasons: 1) Native natural communities make for the best watershed; 2) Native natural communities are unique and vulnerable to impact; 3) Conservation goals are met faster when supported by the human community; and 4) Engagement through volunteer programs leverages efforts and brings ownership to those who volunteer (p. 34).

Table 5-7: EMoWP Activities

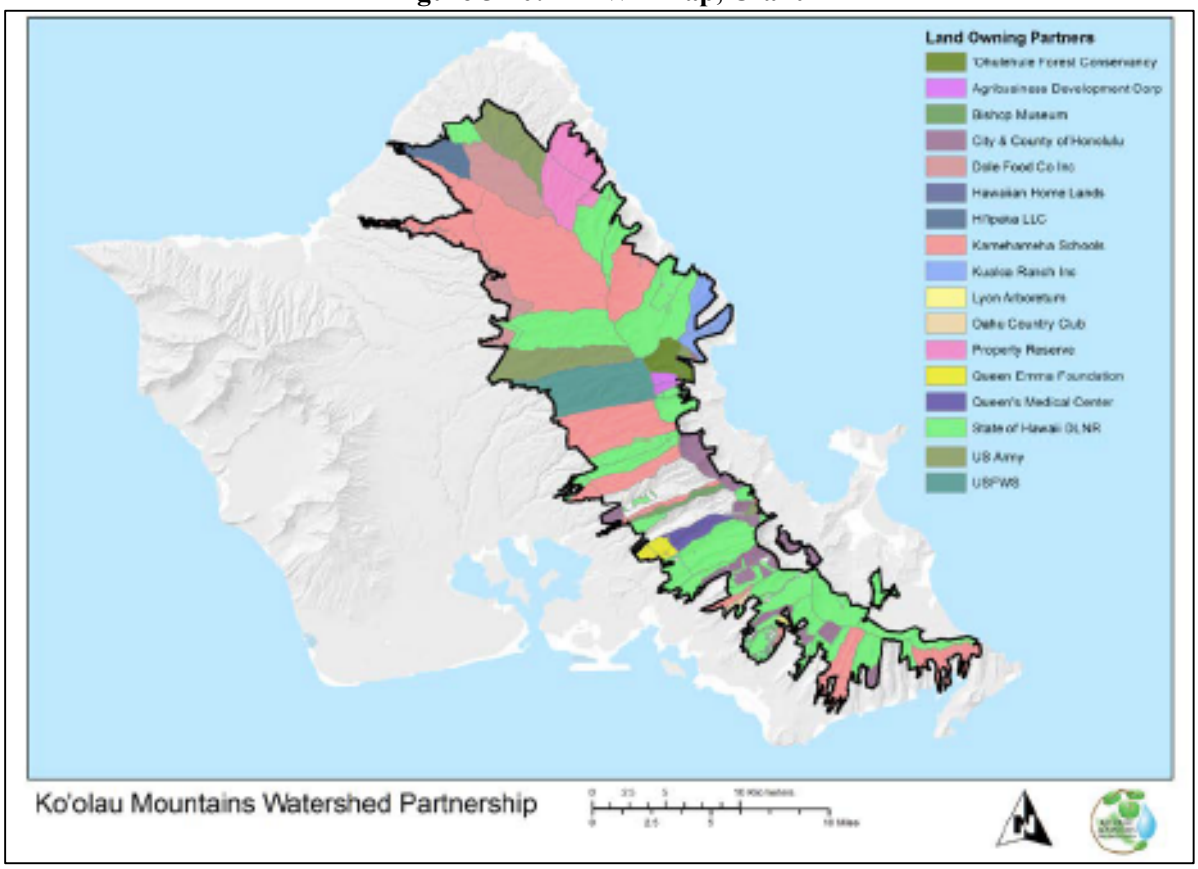
Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	X
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	X
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	
Fencing	X
TOTAL	**10**

Source: Compiled by Author, with data from TNC Staff.

5.3.4 The Koʻolau Mountains Watershed Partnership (KMWP)

The KMWP was established in 1999, with a watershed area of about 98,495 acres of land on the island of Oʻahu (see map in Figure 5-10). Its management plan is from 2002. The staff at KMWP is quite large (12), consisting of a coordinator, an outreach specialist, a data field manager, a dedicated field crew of eight, a data assistant (part-time), plus two part-time contractors not included in this total of 12. Less than 10,000 acres of the management area are currently actively managed. Funding is channeled similarly to most WPs, with PCSU acting as their fiscal agent, and also using the services of a non-profit organization in order to be eligible for federal (FWS, USDA and NRCS and private foundations) funding. KMWP Management reports that about one fourth of the WP's funding is received by DLNR for conservation activities.

Figure 5-10: KMWP Map, O‘ahu



Source: KMWP Action Plan. 2016-2017.

The KMWP is composed of 17 landholding partners and eight Associate Partners (see Table 5-8). One of the partners, Bishop Museum, is in the process of selling its lands but is still an active partner for now. In

Table 5-8: KMWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Bishop Museum	Private	The Nature Conservancy	NGO-National
Tiana Partners, et al.	Private	US Environmental Protection Agency	Public-Federal
Dole Food Company, Inc.	Private	US Fish and Wildlife Service	Public-Federal
Hawai‘i Reserves Inc.	Private	US Forest Service	Public-Federal
Hi’ipaka LLC dba Waimea Valley	Private	USDA Natural Resources Conservation Service	Public-Federal
Kamehameha Schools	Private	US Geological Survey	Public-Federal
Kualoa Ranch	Private	State Department of Health	Public-State
O‘ahu Country Club	Private	Pacific Cooperative Studies Unit	Public-State
‘Ohulehule Forest Conservancy LLC	Private		
Queen Emma Land Company	Private		
US Fish and Wildlife Service – Refuges	Public-Federal		
US Army	Public-Federal		
State Department of Hawaiian Home Lands	Public- State		
State DLNR Division of Forestry and Wildlife	Public -State		
UH Mānoa/Lyon Arboretum	Public- State		
State Agribusiness Development Corporation	Public-State		
City & County of Honolulu Board of Water Supply	Public- County		

Source: Compiled by Author, from Coordinator interview.

order to become a partner, and have a vote, partners need to own lands in the area. Non-members can advise and are welcome to attend meetings. Quarterly meetings were held in the past to discuss partnership activities but this recently changed to every six months as it is a large partnership and meetings suffered low attendance. Meetings abide by "Robert's Rules." All members are supportive of the efforts and work well together but WP Management reports that partners are all very busy.

The majority of KMWP activities (see Table 5-9) are aimed at invasive species control, including weed management (75% or more of the work consists of weed control), mostly for the invasive plants ginger, albizia, and strawberry guava. Hunter issues are not as prominent for O'ahu as on the Big Island. Hunting areas within the management area are administered through DLNR, but the areas to be potentially fenced do not involve prime hunting regions. Protected areas are also far and difficult to access. Goat populations are currently controlled as the Wai'anae region has many goats, but less so in the Ko'olau region.

Table 5-9: KMWP Activities

Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	
Fire Control	
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	
Fencing	X
TOTAL	**7**

Source: Compiled by Author, from Program-wide structured questionnaire.

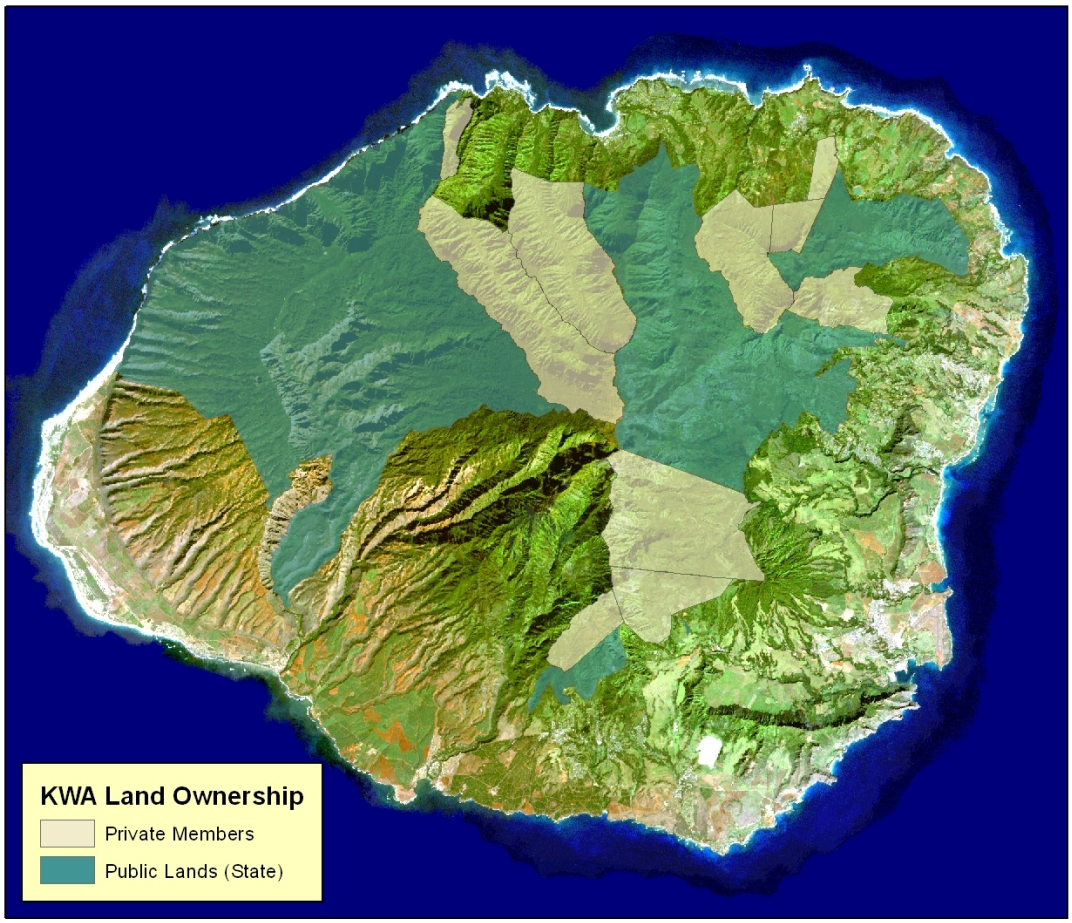
Funding for outreach and education is difficult to come by. The Education and Outreach staff person left the partnership in 2015. The outreach person had worked with local area schools and created a volunteer Program. The current outreach Program is not as prominent as Program management would like it to be, due to the limited funding issue. Access in most WPs is too remote and too dangerous, but there are ample

recreational opportunities at the Ko‘olau watershed on O‘ahu, as the terrain is less rugged and many trails appear favorable for educational hikes and volunteer clearing efforts.

5.3.5 The Kaua‘i Watershed Alliance (KWA)

The KWA was established in 2003 and its management area covers over 144,004 acres of land on the island of Kaua‘i (see map in Figure 5-11). KWA’s coordinator has been on board since the formation of the Alliance and shares his time between TNC and KWA. As in Moloka‘i, TNC essentially functions as the fiscal entity in the same way that PCSU works for the other partnerships (i.e., when someone wants to give KWA money, they give it to TNC). KWA’s staff count currently stands at six, all but one full-time (three field staff, one coordinator, and two assistants).

Figure 5-11: KWA Map, Kaua‘i



Source: HAWP Website. http://hawp.org/partnerships/kauai-watershed/maps-and-documents/. Retrieved on July 31, 2017.

KWA keeps a close relationship with all of its (14) partners (actually referred to as "members") (see Table 5-10). The members meet quarterly and regularly make quorum. Members are also updated monthly. Decisions are made by the coordinator, as members have established trust with KWA and rely on them to make decisions. A project would not be proposed without their consent, but generally the Alliance does not oppose any suggested activities. All partners need to be a landowner and own 1,000 acres or more to become a member of the Alliance (landowners made that rule as the MOU was drafted back in 2003), as determined by original landowner partners before creation of KWA. Local landowners came to TNC in 2003 to collaborate to draft a management plan for the area. They collaboratively set parameters and signed the MOU. Rules originally excluded any state or federal agency except for water departments, but this changed soon thereafter.

In looking at the map (above), it is clear there is a gap in the WP managed area, as one local area owner (owner of numerous acres in the southern section of the WP area) opted out of the partnership. Several attempts to include that landowner were made but failed. This presents a challenge, as no fence can be constructed on their lands and going around it to enclose a unit gets very costly. Otherwise, while KWA members are very busy and have difficulty making time to attend meetings, management reports that they work well together.

Table 5-10: KWA Partners

LANDHOLDING PARTNERS [1]	SECTOR	ASSOCIATE PARTNERS	SECTOR
National Tropical Botanical Garden	NGO-Local	N/A	
Kamehameha Schools Bishop Estate	Private		
McBryde Sugar Company, Ltd.	Private		
Grove Farm Company, Inc.	Private		
Līhu'e Land Company	Private		
Keālia Ranch, LLC.	Private		
B. A Dyer	Private		
Princeville Development , LLC	Private		
Jurassic Kāhili Ranch	Private		
Hawai'i DLNR Division of Forestry and Wildlife	Public-State		
Hawai'i DLNR Division of State Parks	Public-State		
Hawai'i DLNR Division of Land Management	Public-State		
State Department of Hawaiian Home Lands	Public-State		
County of Kaua'i Department of Water [2]	Public-County		

Source: Compiled by Author, from Coordinator interview.
Notes: 1. KWA "Partners" are actually referred to as "Members," as per KWA MOU (2003). 2. While the County of Kaua'i Department of Water does not own any lands in the managed area, they are accorded the same voting right as landowning members by virtue of their mission.

The KWA is currently actively managing around 11,000 acres of its 144,000-acre area, but plans to manage 20,000 within the next ten years. Ungulate fencing, controlling, control, and invasive weed control comprise the bulk of their activities. Kaua‘i’s high priority watershed areas are very remote. These areas are not hunted at all, as they are located at about a one-day hike from any urban area.

KWA focuses on fewer activities than do other partnership (see Table 5-11). Its latest Management Plan (updated in 2012) remains clear on the focus of ongoing activities within the watershed management area: (1) Construct protective fences to isolate ungulate populations; (2) Maintain fence integrity; (3) Control non-native ungulates inside the fences; and (4) Control invasive weed species, consistent with goals established in the original 2005 Plan.

Table 5-11: KWA Activities

Watershed Resource/Ecosystem Monitoring	
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	
Management Infrastructure/Coordination	X
Fire Control	
Vegetation/Rare Species Enhancement/ Protection	
Native Species Enhancement	
Human Activities Management	
Fencing	X
TOTAL	**4**

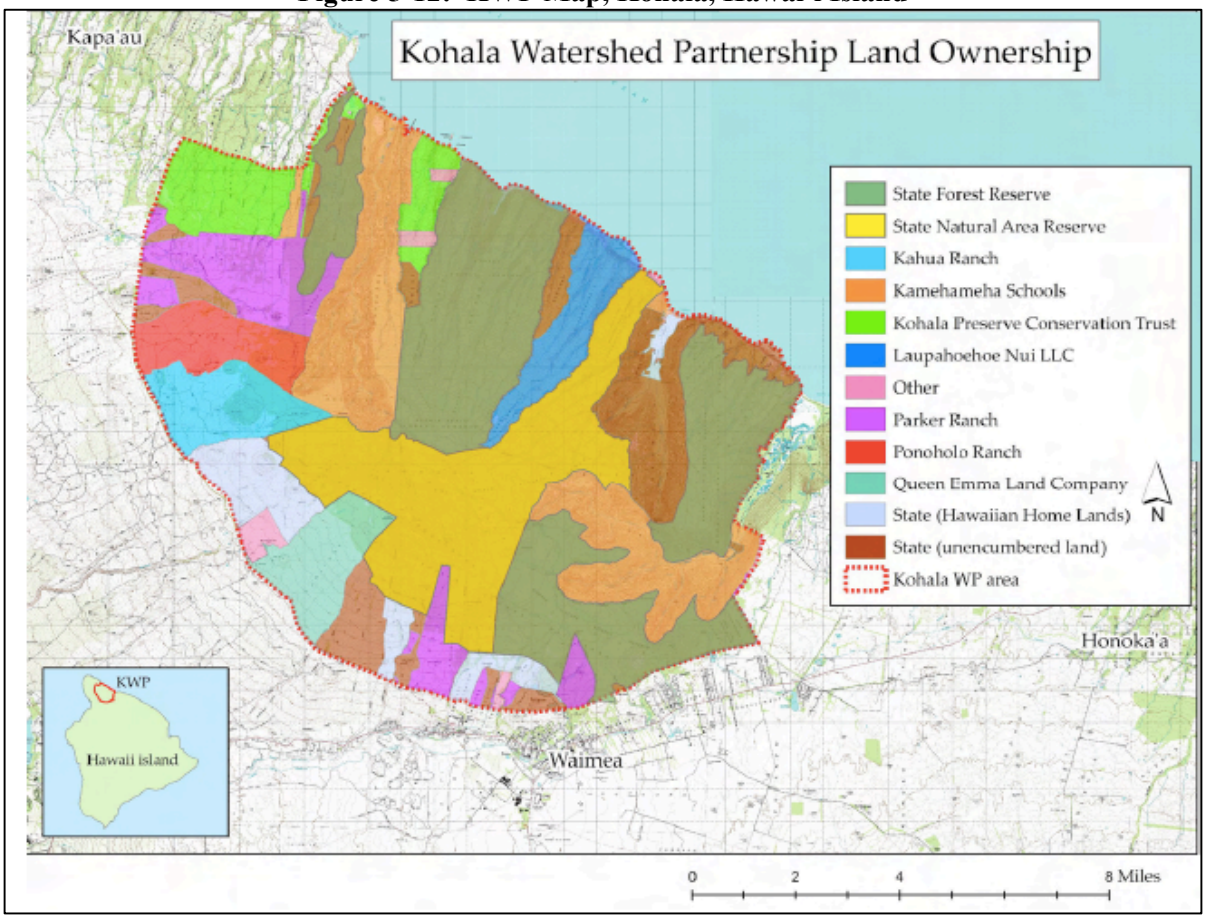
Source: Compiled by Author, from Program-wide structured questionnaire.

One third of KWA’s budget is reported from management as coming from DLNR. As with other WPs, KWA reports there are very limited funds for Outreach activities. There is currently no Outreach coordinator working at KWA. The outreach is largely comprised of being visible in the community, building relationships, and encouraging members to attend the meetings. There is also no volunteer Program because the managed lands are too remote and not accessible to bring people to.

5.3.6 The Kohala Watershed Partnership (KWP)

The KWP was established in 2003, with a watershed area of about 74,120 acres in the northern part of the Island of Hawai‘i (see map in Figure 5-12). The staff consists of a field crew of four, plus a Natural Resources Manager and a Partnership Coordinator (a total of six). During the summer months, KWP also hires two paid interns from the local community. The KWP is set up as a non-profit under the Kohala Center, which receives grants on their behalf. Staffing positions are handled through the Research Corporation of the University of Hawai‘i (RCUH). The KWP Management Plan was drafted in 2008 and has not changed much since then, as it was designed as a 20-year management plan. The Plan was developed after extensive outreach efforts that involved discussions and meetings with a Natural Area Working Group, a Kona/Kohala Natural Resource Area Workshop, a Kohala Forest Management Group (1995-2002), a

Figure 5-12: KWP Map, Kohala, Hawai‘i Island



Source: Kohala Mountain Watershed Management Project. Final Environmental Assessment. 2008.

Waimea Water Roundtable (2006), and input and feedback from individual community members, businesses, government agencies, recreational users, cultural practitioners, private landowners, researchers, and others.

Membership in the KWP is reserved for landowners of more than 500 acres in the area. The WP is made up of nine landowner partners, as well as two Associate partners who are not landowners (see Table 5-12). Decisions about direction are made at bi-monthly meetings by landowning partners. Partners in KWP have well-established existing relationships with the local community, as many partners (such as the ranches) are significant employers in the community and owners/managers are members of longstanding area families. It is hence important for KWP staff and management to know the partners and their role in the community. They understand and take time to build relationships, to have that value of place. The history of KWP thus actually goes farther back than its official 2003 founding -- landowners worked together long before the KWP, when the Kohala forest reserve was established, and they understand the history of the place.

Table 5-12: KWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Parker Ranch	Private	The Nature Conservancy	NGO-National
Ponoholo Ranch	Private	Hawai'i County Dept. of Water Supply	Public-County
Queen Emma Land Co.	Private		
Kohala Preserve Conservation Trust	Private		
Laupāhoehoe Nui LLC	Private		
Kahuā Ranch	Private		
Kamehameha Schools	Private		
State Dept. of Hawaiian Home Lands	Public-State		
State DLNR Division of Forestry and Wildlife	Public-State		

Source: Compiled by Author from Coordinator interview.

In the 1980s Kohala was the center for the "Pig Wars," as they are now called. Prompted by the creation of the Natural Area Reserves Program (NARS) and lots of new money directed at conservation efforts, managers were hired to put up fences quickly. This created tensions in the Kohala community (especially with local hunters, who perceived the fences as hindering access to hunting areas), as no one had engaged or alerted area residents of the intended efforts. This prompted the creation of a Kohala Forest Management

Group, as well as a series of community outreach efforts into the early 2000s. Units built since then for KWP are largely the results of all these meetings. What was not going to be fenced was also chosen to stay open to public (public lands) at that time. Results from the meetings made it such that all the public land in KWP remains open for hunting even to this day. There is only one open access point on public land however (also one on Parker Ranch which requires a code to enter). The community-based approach to finding a solution has been reported by KWP Management to be a win-win for both the conservation community and also for local area hunters.

The KWP actively manages about 8,000 acres of its nearly 75,000 acres. Activities include fence maintenance and ungulate management (pigs as well as goats). Wild goats are a major problem in the area. The KWP is working with DHHL to try to address the issue together. KWP also has a well-developed outreach Program that impacts around 1,000 children each year (2nd grade to high school). Volunteer days center on planting trees and general conservation education. There is currently no specific Outreach Coordinator at KWP to coordinate outreach efforts, so the Program Coordinator takes on these functions. Volunteer hours are used as match for much of the funding received. Working with local area youth is a way to instill ethics of care and of conservation directly into the community. Since 2017, the KWP has also been coordinating response efforts for the discovery of *Rapid Ōhi'a Death*, a disease impacting Hawai'i's native Ōhi'a tree on the Island of Hawai'i.

Table 5-13: KWP Activities

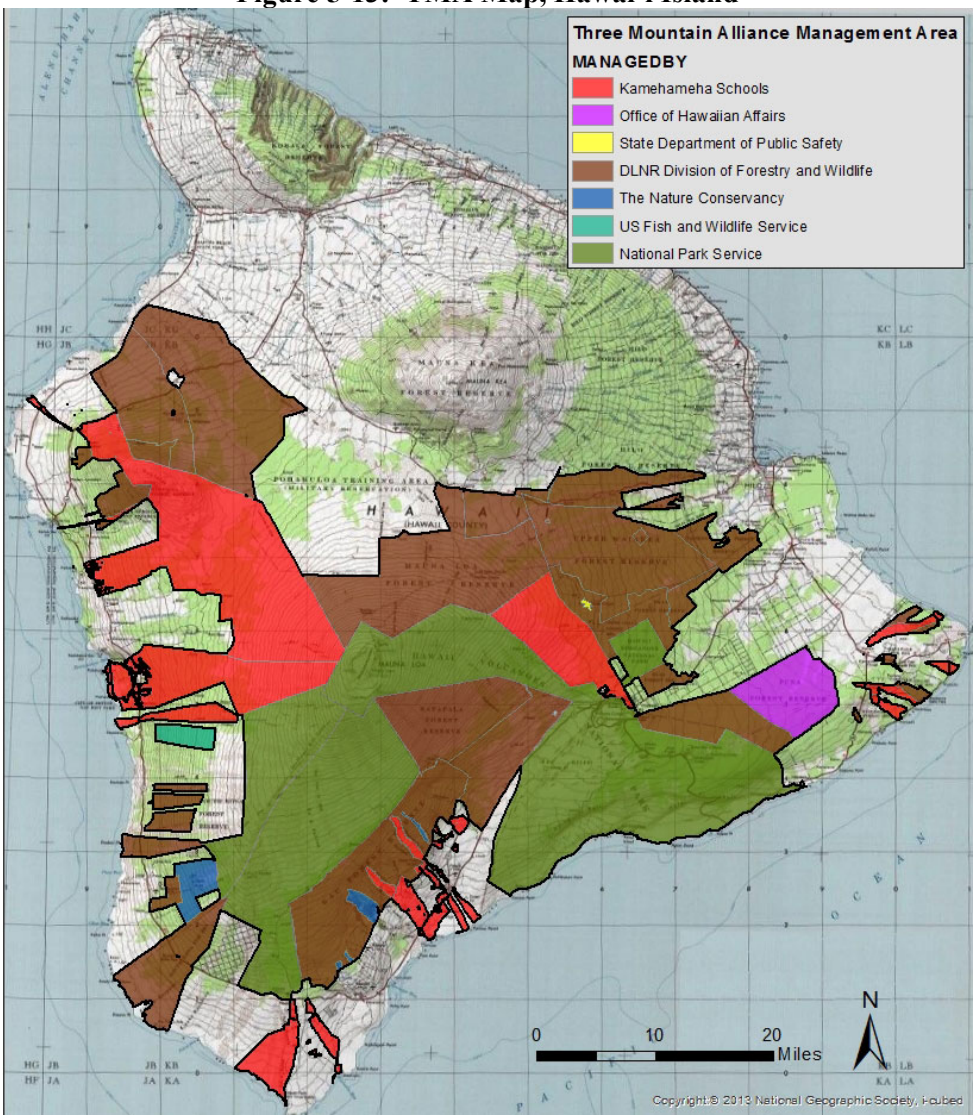
Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	X
Aquatic Pollutant Management	X
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	X
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	X
Fencing	X
TOTAL	**12**

Source: Compiled by Author, from Program-wide structured questionnaire.

5.3.7 Three Mountain Alliance (TMA)

The TMA was established in 2007. It is the largest of the HAWP WPs, with a watershed covering a total of 1,131,011 acres (See map in Figure 5-13). The TMA management area comprises many native habitats but fewer owners than other WPs (note that most of the lands within TMA are owned by federal and state agencies). The partnership started with 32,000 acres of already intact forest. Endangered forest bird species had barely been affected by humans there, as the lands had been the location of a prison and very seldom accessed by hunters or hikers. The focus of the early (1990s) conservation efforts there revolved around

Figure 5-13: TMA Map, Hawai'i Island



Source: TMA website. Three Mountain Alliance Management Area, 2013. http://threemountainalliance.org/wp-content/uploads/TMA_Partners_map.jpg. Retrieved on July 31, 2017.

protecting endangered native birds. Since then, TMA partners have bonded to form an alliance uniting three of the Island of Hawai‘i s four volcanos; the Kīlauea, Mauna Loa, and Hualālai Mountains. PCSU is TMA’s fiscal agent, and partnership employees are hired through RCUH. DLNR funding makes up about 40%-%50 of TMA’s annual operating budget.

TMA has a large staff of 16, including some part-timers and students (only 11-12 are full time on any given day). Part-time or student assistant positions are facilitated for local area undergraduate students as long as they are enrolled in school. Staff also includes a coordinator, a field crew of four, a field supervisor, one educational leader, and a field staff.

Ten partners (see Table 5-14) have agreed by MOA to meet quarterly to discuss activities, get updates, and set priorities for the partnership. Attendance at the meetings is generally good. While the meetings are not publicized, they are open to public. The public generally does attend when a large project is proposed.

Table 5-14: TMA Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
The Nature Conservancy	NGO-National	Pacific Cooperative Studies Unit	Public-State
Kamehameha Schools	Private		
National Park Service	Public-Federal		
US Fish and Wildlife Service	Public-Federal		
USDA Natural Resources Conservation Service	Public-Federal		
USDA Forest Service	Public-Federal		
US Geological Survey	Public-Federal		
Hawai‘i Department of Public Safety	Public-State		
Office of Hawaiian Affairs	Public-State		
State DLNR Division of Forestry and Wildlife	Public-State		

Source: Compiled by Author, from Coordinator interview.

Of the partnership’s more than 1 million acres, around 70,000 are currently actively managed (either fenced or areas where planting or monitoring is occurring). The focus of their efforts is on managing pigs, sheep, and the wet forest. TMA management believes that environmental education is one of the most important things they can do, and one of their greatest strengths is their education and outreach program. For the last 15 years, TMA has partnered with various local programs (such as Kamehameha Schools, or other local

schools, non-profit groups, as well as the University of Hawai'i) who have existing environmental education programs. It has also facilitated trainings, internships, teacher trainings and species plantings, as well as exhibits at community events that are open to the public.

Table 5-15: TMA Activities

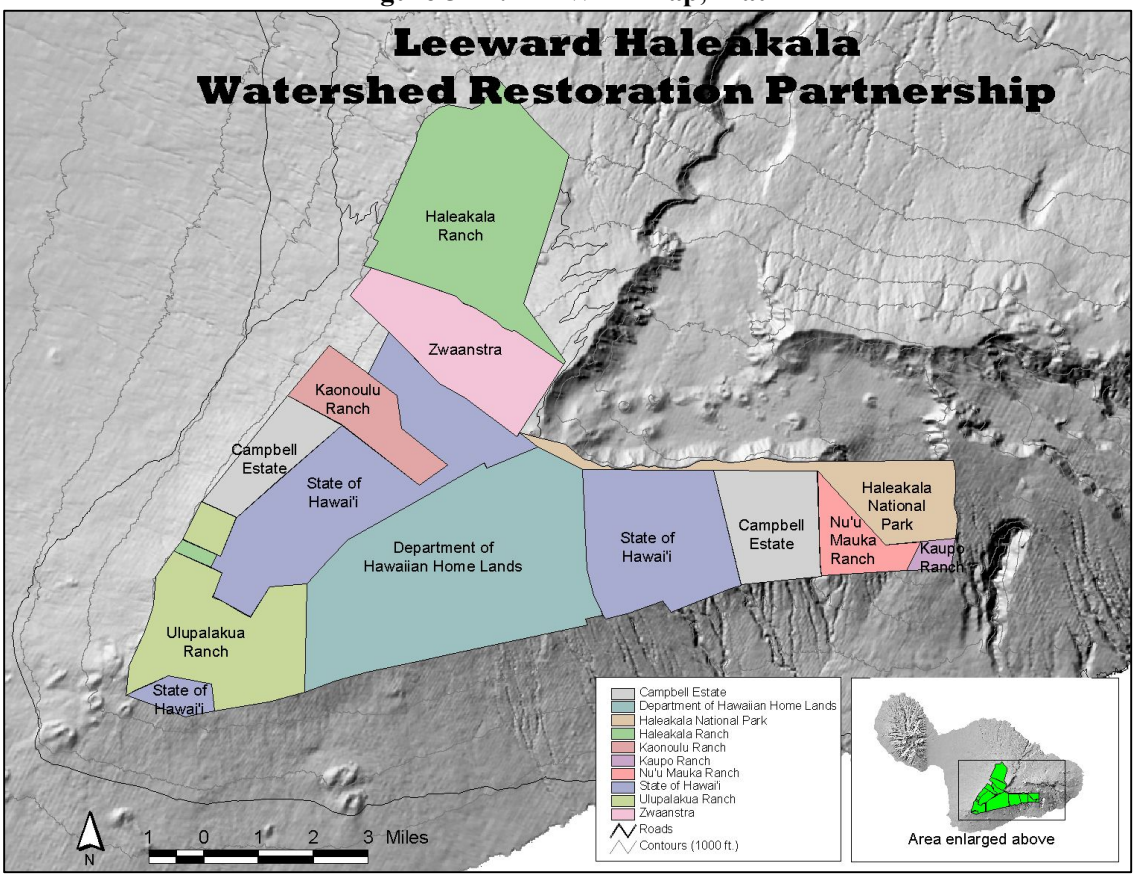
Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	X
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	
Fencing	X
TOTAL	**9**

Source: Compiled by Author, from Program-wide structured questionnaire.

5.3.8 Leeward Haleakalā Watershed Restoration Partnership (LHWRP)

The LHWRP was established in 2003 and its watershed covers 43,058 acres of land in the southern part of Maui Island (see map in Figure 5-14). Its last Management Plan was completed in 2006 and the partnership is in the process of updating it. The LHWRP currently has a staff of eight, including four field crew, one contract field crew, one coordinator, one administrative assistant (a Program and data assistant who also does tasks such as Human Resources) and one intern (hired through a local non-profit under an educational stipend). Most employees are hired via the RCUH, and the fiscal agent for the partnerships is PCSU as with most of HAWP's WPs. About one-third of the partnership's total operating budget is supported by DLNR. Around 16,000 acres out of the total 43,175 acres of lands in the LHWRP are currently being actively managed. The LHWRP's focus is on "planting good trees and killing the bad ones" (LHWRP Coordinator, 2016). The leeward side of the Island of Maui is not as wet or green as eastern Maui, with little native forest remaining, so the activities focus on trying to revive the native forest. LHWRP staff currently are actively collecting seeds of native plants locally.

Figure 5-14: LHWRP Map, Maui



Source: LHWRP Management Plan, 2006.

There are now 11 partners and 17 Associate Partners in LHWRP (see Table 5-16). Partnership decisions are made by vote. The MOU was signed only by the landowning partners, and LHWRP is now trying to formalize the role of supporting partners as it is not yet clear what that role should be. Supporting partners do not currently have voting rights. Partners meet once a year to discuss partnership activities but management's goal is to increase this to twice a year. An Executive Committee makes ultimate decisions.

Thus far, partnership management does not recall ever having been asked by a non-landowning partner to join the partnership. Most of the management area is located high, near the cloud line, in areas already within the State's conservation district boundary and not easily accessible even for landowners. If an individual with limited land assets wanted to join, the decision would ultimately be made by the Executive

committee and other partners. Partners typically bring with them some sort of resources into the agreement, so the addition of a non-landowner partner seems unlikely.

Table 5-16: LHWRP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Haleakalā Ranch	Private	Hawai‘i Community Foundation	NGO-Local
Kama‘ole Ranch	Private	Ka ‘Ohana O Kahikinui	NGO-Local
Ka‘ono‘ulu Ranch	Private	Kahikinui Game & Land Management ‘Ohana	NGO-Local
Kaupō Ranch	Private	Living Indigenous Forest Ecosystems	NGO-Local
Nu‘u Mauka Ranch	Private	Maui Restoration Group	NGO-Local
Thompson Ranch	Private	Southwest Haleakalā Watershed Partnership	NGO-Local
‘Ulupalakua Ranch	Private	Tri-Isle Resource Conservation & Dev. Council	NGO-Local
John Zwaanstra	Private	‘Olino	NGO-Local
Haleakalā National Park	Public-Federal	Goodfellow Brothers	Private
State Department of Hawaiian Homelands	Public-State	U. S. Dept. of Agriculture—NRCS	Public-Federal
State DLNR Division of Forestry and Wildlife	Public-State	U. S. Fish & Wildlife Service	Public-Federal
		U. S. Geological Survey	Public-Federal
		Pacific Cooperative Studies Unit	Public-State
		Hawai‘i Tourism Authority	Public-State
		County of Maui—Department of Water Supply	Public-County
		County of Maui—Office of Economic Development	Public-County

Source: Compiled by Author, from Coordinator interview.

The LHWRP has no education and outreach Program. They would reportedly welcome such a Program, but the difficulties associated with access to the rugged remote terrain of the management area cause some concern. The terrain is extreme and only accessible via helicopter.

Table 5-17: LHWRP Activities

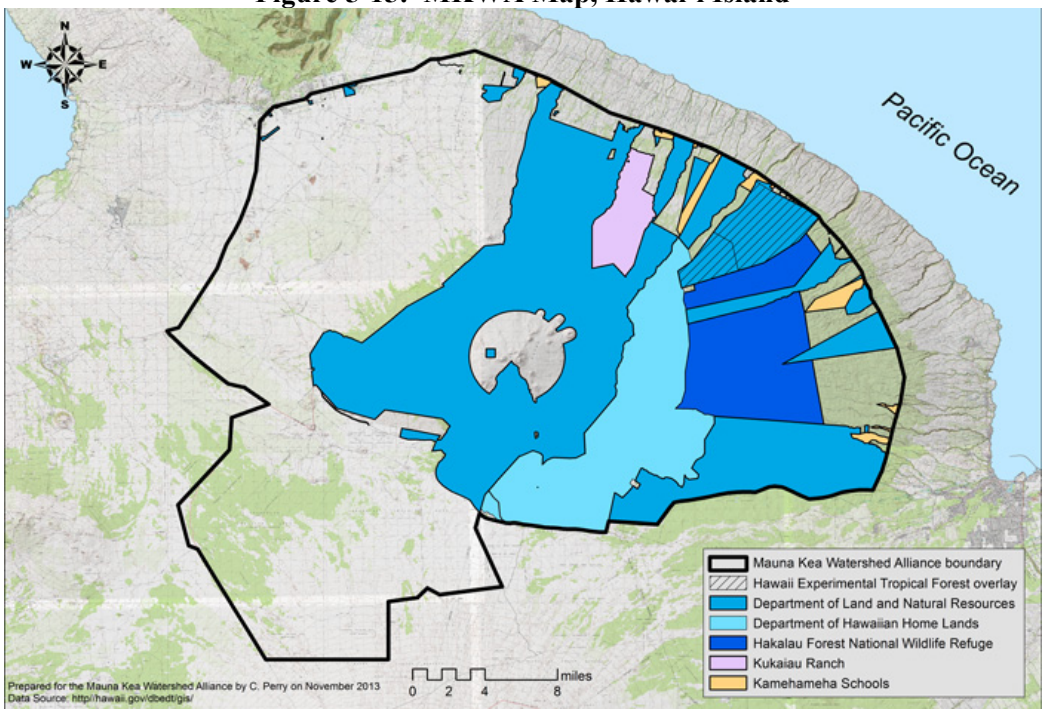
Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	X
Management Infrastructure/Coordination	X
Fire Control	X
Vegetation/Rare Species Enhancement/ Protection	X
Native Species Enhancement	X
Human Activities Management	X
Fencing	X
TOTAL	**10**

Source: Compiled by Author, from Program-wide structured questionnaire.

5.3.9 Mauna Kea Watershed Alliance (MKWA)

The MKWA was established in 2010, and its watershed area covers approximately 256,250 acres of land in the northeastern portion of the Island of Hawai‘i, the Big Island. Its coordinator has been at MKWA since 2011. PCSU is the Alliance's fiscal agent as with most partnerships in HAWP. MKWA has a smaller staff of four, and their management plan was drafted in 2010.

Figure 5-15: MKWA Map, Hawai‘i Island



Source: MKWA website. About Mauna Kea Watershed Alliance, 2013. http://maunakeawatershed.org/about-mauna-kea-watershed-alliance/. Retrieved on July 31, 2017.

The MKWA consists of five landowning partners and three associate partners (see Table 5-18), all of whom actually have a vote (unique among Hawai‘i's WPs). Although there is no written rule about who can become a partner, the MKWA partners all own at least 1,000 acres at about the 2,000 feet elevation of Mauna Kea. Anyone who meets that criteria can join. Decisions are made by consensus in the Executive Committee. The Chair is the MKWA Supervisor, who oversees the work of the staff, including the MKWA Coordinator. It has generally been challenging to have everyone participate, as partners are all busy, but they try to meet quarterly. Around 1,000 non-partner residents live within the MKWA management area, but nobody from the area has yet asked to become member.

Table 5-18: MKWA Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Kamehameha Schools	Private	The Nature Conservancy	NGO-National
Kuka'iau Ranch	Private	Pacific Islands Fish and Wildlife Office	Public-Federal
Hakalau Forest National Wildlife Refuge	Public-Federal	Institute of Pacific Islands Forestry	Public-Federal
Department of Land and Natural Resources	Public-State		
Department of Hawaiian Home Lands (DHHL)	Public-State		

Source: Compiled by Author, from Coordinator interview.

Rapid ʻŌhiʻa Death, a disease affecting Hawaiʻi's native tree, is the partnership's biggest problem. This disease can kill an ʻōhiʻa tree in less than one week. This problem has arisen in the last five or six years. Most of MKWA funding goes to the monitoring of pigs within fenced in management units, monitoring a specific bird corridor and a forest corridor in the MKWA management area.

While there is a very significant problem with controlling large populations of wild ungulates destroying the native ecosystem in the MKWA management area, utilizing the support of local hunters to address the problem is made more difficult because a great number of those animals are located on lands owned by the Department of Hawaiian Home Lands (DHHL). However, no one is allowed to hunt on DHHL lands (even Hawaiians), which comprise a large portion of the watershed. When miles of fence went up, thousands of sheep were trapped in the enclosed area, and are now all over DHHL's lands.

Table 5-19: MKWA Activities

Watershed Resource/Ecosystem Monitoring	X
Ungulate Control	X
Feral Animal Control (non-ungulate)	X
Aquatic Pollutant Management	
Invasive Weed Control	X
Public Education and Outreach	
Management Infrastructure/Coordination	X
Fire Control	
Vegetation/Rare Species Enhancement/ Protection	
Native Species Enhancement	X
Human Activities Management	
Fencing	X
TOTAL	**7**

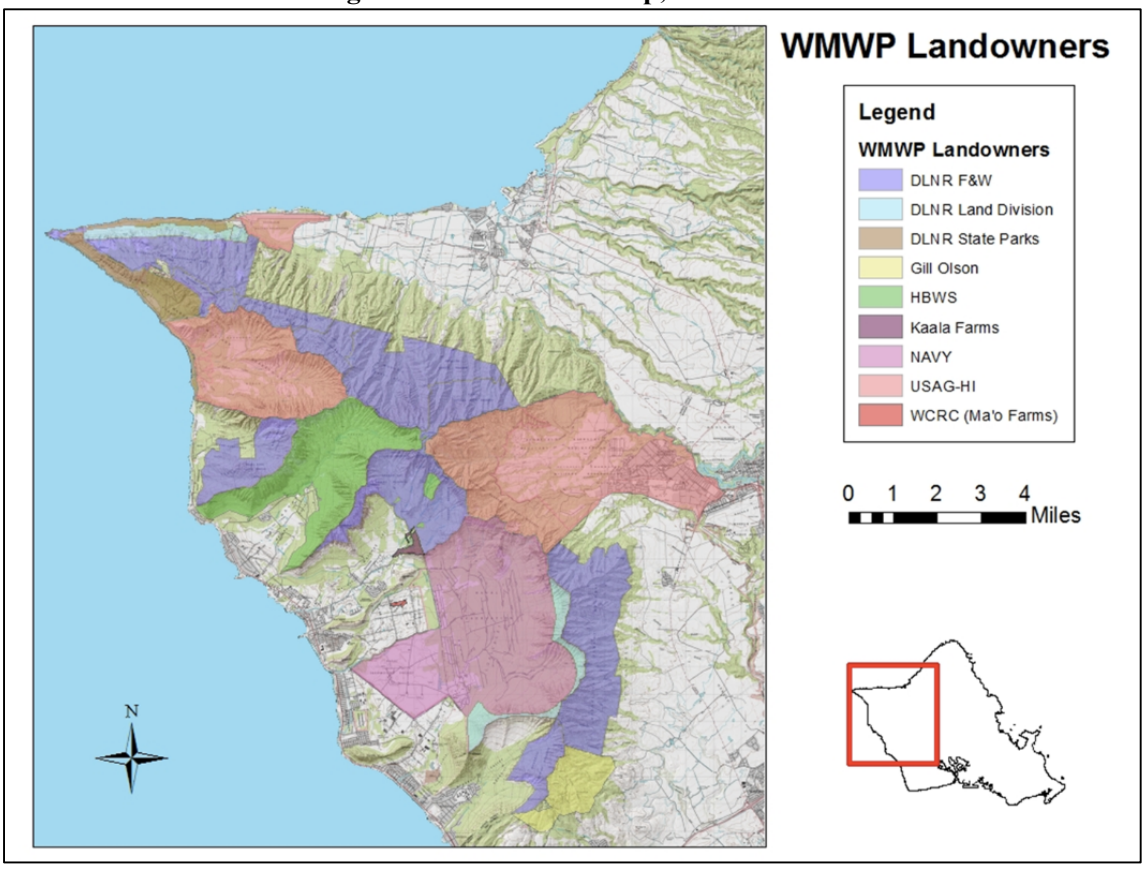
Source: Compiled by Author, from Program-wide structured questionnaire.

MKWA Management reports that they take a proactive approach to interacting with local area community. Staff take residents to plant trees within their management area. They also perform school group outreach, and coordinate plantings (the MKWA Coordinator does this as there is no education and outreach staff).

5.3.10 Wai‘anae Mountains Watershed Partnership (WMWP)

The WMWP was established in 2010, and its watershed area encompasses more than 46,412 acres in the western portion of the Island of O‘ahu. The WMWP is the newest of all the WPs in HAWP. Its developing (still in draft form) management plan suggests that WMWP’s overall goal for invasive plant management is to maintain and/or improve WMWP priority areas by containing, eradicating, and excluding priority habitat-modifying weeds, Feral Ungulate Management, Native Habitat Restoration, Cultural and Historical Resource Management, Cooperative, Sustainable Watershed Resource Use, Wildfire Prevention and

Figure 5-16: WMWP Map, West O‘ahu



Source: Retrieved online on July 31, 2017. https://prezi.com/lxi5ns1ouxs3/waianae-mountains-watershed-partnership/.

Management, and Watershed Monitoring and Assessment. However, very little more is known about the administrative structure and progress on activities as the WMWP management plan was still being developed at the time of this research, and the management team unavailable to discuss progress in person (despite numerous attempts to meet or discuss over the phone).

The WMWP consists of a partnership between seven landowning partners and three associate partners. Because the largest owner in the partnership is the United States military, facilitating on-site outreach can pose unique challenges (requiring security and identification requirements not necessary at other sites). Still, the WMPP facilitates a number of outreach activities in and near the WP management area working in nearby Kōkua Valley and with neighboring area schools and community groups.

Table 5-20: WMWP Partners

LANDHOLDING PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Gill-Olson Joint Venture	Private	Mālama Learning Center	NGO-Local
Kaʻala Farms, Inc.	Private	Oʻahu Invasive Species Committee	Pub/Pvt Partnership
MA'O Organic Farms (Waiʻanae Cmnty Re-Dev. Co.)	NGO-Local	Oʻahu Plant Extinction Prevention Program	Pub/Pvt Partnership
US Army Garrison Hawaiʻi	Public-Federal		
Navy Region Hawaiʻi	Public-Federal		
Department of Land and Natural Resources	Public-State		
Board of Water Supply	Public-County		

Source: Compiled by Author from Coordinator interview.

5.3.11 Lānaʻi Forest and Watershed Partnership (LFWP)

The LFWP is not currently active. It was briefly in operation from 2011 to 2013 for limited activities, but due to a change in the island's ownership (the entire island of Lānaʻi is owned by businesses controlled by one landowner, software magnate Larry Ellison), the LFWP is on hiatus. Lānaʻi's land is generally flat and dry, however, its watershed forest is quite moist, high in elevation and steep. The TNC still owns an easement on Lānaʻi and occasionally staff will go over there to check on its status. Recently, Pulama Lānaʻi, the Island's owner's principal corporate entity, has expressed a desire to do its own management of that easement; however, TNC is not ready to give up the perpetual easement it manages. When the LFWP was active (while the island was owned by David Murdock, a businessman and philanthropist who

enthusiastically supported conservation activities), it consisted of 11 partners (including Mr. Murdock through his corporate entity, Castle and Cooke Resorts LLC).

Table 5-21: LFWP Partners (PRE-HIATUS)

PARTNERS	SECTOR	ASSOCIATE PARTNERS	SECTOR
Castle and Cooke Resorts, LLC	*Private*	N/A	
The Nature Conservancy	NGO-National		
Hui Mālama Pono O Lānaʻi	NGO-Local		
US Department of Agriculture, NRCS	Public-Federal		
US Fish and Wildlife Service	Public-Federal		
Molokaʻi-Lānaʻi Soil & Water Conservation District	Public-State		
State DLNR Division of Forestry and Wildlife	Public-State		
State Commission Water Resource Management	Public-State		
County of Maui	Public-County		
Lānaʻi Water Advisory Committee	Public-County		
Maui County Department of Water Supply	Public-County		

Source: Compiled by Author.

5.3.12 Summary of Partnerships

Overall, Hawaiʻi's ten WPs all have unique challenges, as well as prospects. At this time, only one of the WPs has a dedicated, funded position for a staff person to solely focus on educational programs as well as conduct outreach events in the community. However, a great majority are still involved in these types of activities. The number of activities conducted by partnership varies from 4 to 12, with fencing and ungulate control, as well as invasive species management being the most prevalent activities performed.

The KMWP on the Island of Oʻahu has the most partners (17), which makes much sense, as the Island is the State's most populated. The KWA and the TMA manage over 40% of the entire area of their islands. For the Island of Hawaiʻi, however, if you add the 3% managed by the KWP and the 10% managed by the MKWP, the percentage of acres managed is more than 55% of the entire island.

Finally, the number of staff at each WP is relatively small, especially considering the scope of the management efforts conducted, as well as the number of activities conducted at each site. TMA, which has the largest management area, also has the largest staff.

Table 5-22: Summary Findings by Partnership (2016)

	Year Established	Island Population [1]	% of Island Acres Managed by WP	Number of Activities Conducted	Number of Staff	Dedicated Outreach Staff	Number of Landholding Partners
EMWP (Maui)	1991	150,203	24%	8	8	✔	6
WMMWP (Maui)	1998	150,203	10%	10	10	–	9
EMoWP (Molokaʻi)	1999	7,206	25%	10	6	–	6
KMWP (Oʻahu)	1999	984,178	26%	7	12	–	17
KWA (Kauaʻi)	2003	69,691	41%	4	6	–	14
KWP (Hawaiʻi)	2003	191,482	3%	12	6	–	9
TMA (Hawaiʻi)	2007	191,482	44%	9	16	–	10
LHWRP (Maui)	2003	150,203	9%	10	8	–	11
WMWP (Oʻahu)	2010	984,178	12%	N/A	N/A	N/A	7
MKWA (Hawaiʻi)	2010	191,482	10%	7	4	–	5

Source: Compiled by Author. **Note:** (1) State of Hawaii, DBEDT. 2015 Databook. Note: (✔) There is staff dedicated for this task; (X) There is no staff dedicated for this task; (N/A) Data is not available.

5.4 Hawaiʻi Association of Watershed Partnerships Memorandum of Understanding

A memorandum of Understanding (MOU) is sometimes used as a confirmation of agreed-upon terms when an oral agreement is not yet a formal contract. Most often, however, an MOU is a contract that sets forth basic principles and guidelines under which parties or signatories agree to work together to accomplish joint goals. A Memorandum of Agreement (MOA) (also known as a cooperative agreement) is a legal document that is more formal than a verbal agreement but less formal than a contract. MOUs and MOAs are very similar, but an MOA is usually used for agreements between public bodies and/or government agencies.

HAWP signed an MOU in 2003 with six existing WPs on five islands: WMMWP and EMWP (on Maui), EMoWP (on Molokaʻi), LFWP (on Lānaʻi), KMWP (on Oʻahu), and KWA (on Kauaʻi). The KWP and the Olaʻa Kīlauea Partnership (aka TMA on Hawaiʻi Island) signed on in 2004; the LHWRP on Maui signed the MOU in 2005; and finally the MKWA (Hawaiʻi Island), WMWP (on Oʻahu), and TMA (as TMA) on Hawaiʻi Island all signed in 2013. The MOU established among the then-existing eleven Watershed

Partnerships (including the Lānaʻi partnership which is no longer active) contained 17 points of agreement (in principle), including:

1. To develop, jointly, a capacity-building strategy to support *mauka*[6] watershed partnerships, and to identify funding needs of the partners, to be reviewed annually.
2. To consider jointly, at such places and at such intervals as may be mutually agreed upon by the affected partners, general activities to increase public and political support for island-based mauka watershed partnerships.
3. To support the formation, development, and capacity building of the new partnerships in mauka watershed areas where they did not currently exist.
4. To determine costs of watershed management programs. Expenditures, resource commitments, and activities under this MOU will be determined by individual working agreements described below.
5. To develop and implement specific agreements and working plans for individual projects considered by all or some of the partners having mutual interests. Such agreements and working plans may be developed whenever appropriate.
6. Partners and partners' individual members may join in cooperative efforts to raise funds to be used solely for individual projects to the extent each partner or partners' individual members agree and are authorized to do so.
7. To enter into specific agreements between all or some of the partners or partners' individual members, as the occasion demands, for the use of specialized equipment, hiring and supervision of personnel, transfer of funds, purchasing of supplies. And other matters pertaining to the general purpose of management agreed-upon by all or some of the partners or partners' individual members on terms and conditions to be agreed-upon between the affected landowners and partners.
8. That any partner may terminate their involvement in this MOU by providing thirty (30) days prior written notice to the other partners.
9. Each partner expressly understands and agrees that:
    a. This MOU does not establish a legal partnership between partners of partners' individual members, and any actions taken, documents executed, or agreements made pursuant to this MOU shall not create a legal partnership unless otherwise expressly stated in writing.
    b. No partner or partners' individual members shall have either the liability of a partner or the power to bind any other partner or partners' individual member as a partner.
    c. No partner shall represent or indicate in any manner to third parties that the partner is a partner of any other partner or partners hereto, or that collectively the partners (or any number of them) are a partnership, as defined by the laws of the State of Hawaiʻi.
10. This MOU shall not modify the existing authority of any government agency partner in reducing, expanding, or transferring any of the statutory or regulatory authorities and/or responsibilities of any such partners.

[6] Mauka is the Hawaiian word for upper-elevation mountain areas.

11. The MOU may be modified at any time by mutual written consent and shall become effective upon being reduced to a written instrument executed by all partners.
12. The Hawai‘i Association of Watershed Partnership does not intend that any partner receive any direct or indirect benefit by virtue of its participation in the agreement, except where such benefit may be incidental to the primary purpose of maintaining healthy watersheds. Partners shall exercise care in obtaining funds and provide sufficient notification to Kamehameha Schools, which is an individual member of several of the individuals partners, in the event funds are being obtained for use on Kamehameha Schools Lands.
13. Kamehameha Schools is not and shall not be recipient of federal financial assistance under this agreement or any specific agreements and working plans for individual projects, and Kamehameha Schools is not and shall not be required, by virtue of this MOU, to comply with Federal Laws applicable to recipients of financial assistance, including without limitation Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act, each as amended, or their respective implementing regulations. Nothing in this paragraph shall affect Kamehameha Schools' obligations under other federal and state laws and regulations, including without limitation Title VII of the Civil Rights Act of 1964, Executive Order 11246, the Americans with Disabilities Act, and Hawai‘i nondiscrimination laws.
14. For purposes of this MOU, "Federal Financial Assistance" shall have the meaning set forth in Title VI of the Civil Rights Act of 1964, as amended, and the applicable implementing regulations. As of the date of this MOU, regulation of the U.S. Department of the Interior implementing Title VI defines "Federal Financial Assistance" to include "(1) Grants and loans of federal funds, (2) The grant or donation of federal property and interests in property, (3) The detail of federal personnel, (4) The sale and lease of, and the permission to use (on other than casual or transient basis), federal property or any interest in such property without consideration which is reduced for the purpose of assisting the recipient, and, (5) Any federal agreement, arrangement, or other contract which has as one of its purposes the provision of assistance."
15. The partners and the partners' individual member private landowners enter into this MOU voluntarily and are not, under the MOU, acting under the direction or compulsion of any governmental agency or performing a public function that such agency would otherwise be required to perform, and is not a state actor or acting under color of state or federal law.
16. This agreement sets forth the entire agreement between the partners and supersedes any and all prior agreements or understandings between them pertaining to HAWP matters.
17. This agreement may be signed in counterparts, each of which shall be considered an original, and the counterparts shall together constitute one agreement, binding all of the parties to the agreement, notwithstanding that all of the parties are not signatory to the original or the same counterparts. Duplicate unexecuted and unacknowledged pages of counterparts may be discarded and the remaining pages assembled as one document. (HAWP MOU, 2003, pp. 2-5)

In addition to signing a collective Association-wide MOU (HAWP MOU above), each individual partnership signed its own MOU with its respective partners:

Table 5-23: Partnership Agreements

Partnership	Agreement
EMWP	Master Cooperative Agreement with its respective partners in 1991.
WMMWP	MOU with its respective partners in 1998.
KMWP	MOU with its respective partners in 1999.
LFWP	MOU with its respective partners in 2001. [7]
KWA	MOU with its respective partners in 2003.
KWP	MOU with its respective partners in 2003.
EMoWP	MOU with its respective partners in 2003.
HHWRP	MOU with its respective partners in 2003.
TMA	MOU with its respective partners in 2007. [8]
MKWA	MOU drafted by 2010. [9]
WMWP	MOU with its respective partners in 2010. [10]

Source: Compiled by Author from WP Management Plans and online research.

5.5 Public Consultation

This section elaborates on the mechanisms that promote consultation with non-partner community members about management activities conducted in their communities. The section will cover environmental disclosure, legislative and court-mandated mediation, and communications ensuing from in-person confrontation ("social stand-offs").

5.5.1 Environmental Disclosure

Environmental regulation in the U.S. has mandated citizen involvement for agency actions since the National Environmental Policy Act of 1969. Since then, various state, county, and municipal laws have replicated this effort and embedded the means for citizen input via comment periods on environmental

[7] According to: http://www.co.maui.hi.us/DocumentCenter/View/12734 . No copy found.
[8] According to: http://dlnr.hawaii.gov/ecosystems/files/2013/09/Item-3-Proposal-and-DOFAW-Recommendation-Puu-Makaala-Extension.pdf . No copy found.
[9] According to: http://hawaii.gov/dlnr/chair/meeting/submittals/090911/C-FW-Submittals-C1.pdf. No copy of the signed document found.
[10] According to: http://www.nmfwa.net/uploads/conference/presentations/Campora_Utilizing_WMWP_for_plant_conservation_in_LLL.pdf . No signed copy found.

disclosure documents for qualifying projects originating from both private and public sectors. The intent of increased opportunity to have a "voice" in the process of identifying potential impacts is worthwhile; however, environmental laws remain largely top-down initiatives which ultimately only serve as informational documents for community members. Public consultation is mandated as part of the State of Hawai'i's Environmental Policy Act (HEPA), Hawai'i Revised Statute (HRS) Chapter 343. Comment periods, formally known as consultation, vary – depending on whether the type of proposed action is anticipated to have significant effect on the environment – from a total of 30 days for an environmental assessment (EA) (for projects that are not anticipated to have a significant impact) to a total 75 days for an environmental impact statement (for projects anticipated to have a significant impact).

5.5.1.1 Hawai'i Environmental Policy Act (Chapter 343)

Opportunities to participate by commenting on proposed actions and/or programs are fundamentally supposed to engage the public as well as inform the process of environmental assessment. There are currently four statutorily excluded types of actions for which State of Hawai'i agencies do not have to conduct environmental disclosure, as well as eleven classes of exemptions that permit agencies to move forward on specific projects without having to go through the process.

5.5.1.1.1 Statutory Exclusions from environmental disclosure: (4)

- Purchase of the assets of the Waiāhole water system (Section 343-6.5, HRS)
- Proposed reconstruction, restoration, repair, or use of any Hawaiian fishpond provided that compliance with certain conditions in Section 183B-2, HRS is met; [11]

[11] [§183B-2] Exemption from environmental impact statement law. The proposed reconstruction, restoration, repair, or use of any Hawaiian fishpond shall be exempt from the requirements of chapter 343; provided that it will comply with the following conditions:
(1) The fishpond is not adjacent to a sandy beach;
(2) The fishpond stocks only native aquatic organisms;
(3) The fishpond does not operate as an intensive culture system in which cultured organisms require frequent or periodic artificial feeding, artificial aeration of water, or artificial pumping of water through the fishponds for their growth and survival;
(4) Bulk chemicals are not added to the water for the control of pathogens or parasites;
(5) Coastal access is allowed to any person mauka of the fishpond and makai of walls;
(6) The fishpond and its operations do not harm any threatened or endangered species; and
(7) The fishpond is not used for water recreational purposes except those recreational activities customarily and traditionally practiced in Hawaiian fishponds prior to 1778. [L 1995, c 177, pt of §2]

- Affordable housing, provided that compliance with certain conditions in Section 2014H-38, HRS is met; [12]
- Broadband infrastructure, provided that compliance with certain conditions in Act 151, SLH 2011, is met. [13]

5.5.1.1.2 Agency Exemptions from Environmental Disclosure: (11)

Under HEPA, each agency is required by rule to develop a list of specific types of actions it may perform that fall under the "Eleven Exempt Classes of Action" (see 11 classes of action below). State agencies in Hawai'i must submit this list and periodic amendments to the Environmental Council (EC) for review and concurrence. An agency's exemption list helps determine whether to declare routine actions exempt. Each agency is required by rule to develop a list of specific types of actions it may perform that fall within the 11 classes. The lists must be consistent with both the letter and intent expressed in the 11 classes and Chapter 343. An agency's exemption list helps determine whether to declare routine actions exempt.

5.5.1.1.3 Exemptions (11-200-8, HAR, Exempt classes of action) (11)

Certain projects or actions that trigger HEPA, but are deemed minor or routine by the overseeing state or county agency, may be declared exempt from the Chapter 343 process. There are 11 classes of actions that agencies may use to find, after consultation, that an action is exempt.[14]

1. Operations, repairs, or maintenance of existing structure, facilities, equipment, or topographical features, involving negligible or no expansion or change of use beyond that previously existing.
2. Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced.
3. Construction and location of single, new, small facilities or structures and the alteration and modification of the same, including, but not limited to:

a. Single-family residences less than 3,500 square feet not in conjunction with the building of two or more units;

[12] See http://law.justia.com/codes/hawaii/2011/division1/title13/chapter201h/201h-38/
[13] http://files.hawaii.gov/dcca/broadband/act-151/Act_151.pdf
[14] See examples of exemption notices: http://oeqc.doh.hawaii.gov/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fShared%20Documents%2fEA_and_EIS_Online_Library%2fExemption%20Notices&View=%7bC0C5C897-3066-4821-864E-36FB3D77F5D5%7d

b. Multi-unit structures designed for not more than four dwelling units if not in conjunction with the building of two or more such structures;
c. Stores, offices, and restaurants designed for total occupant load of twenty persons or less per structure, if not in conjunction with the building of two or more such structures; and
d. Water, sewage, electrical, gas, telephone, and other essential public utility services extensions to serve such structures or facilities; accessory or appurtenant structures including garages, carports, patios, swimming pools, and fences; and, acquisition of utility easements;
4. Minor alterations in the conditions of land, water, or vegetation;
5. Basic data collection, research, experimental management, and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource;
6. Construction or placement of minor structures accessory to existing facilities;
7. Interior alterations involving things such as partitions, plumbing, and electrical conveyances;
8. Demolition of structures, except those structures located on any historic site as designated in the national register or Hawai‘i register as provided for in the National Historic Preservation Act of 1966, Public Law 89-665, 16 U.S.C. §470, as amended, or Chapter 6E, HRS;
9. Zoning variances except shoreline setback variances;
10. Continuing administrative activities including, but not limited to, purchase of supplies and personnel related actions; and
11. Acquisition of land and existing structures, including single or multi-unit dwelling units, for the provision of affordable housing, involving no material change of use beyond that previously existing, and for which the legislature has appropriated or otherwise authorized funding.

5.5.1.1.4 Agency List Amendments

It is possible for an agency to update or amend its current exemption list. While the exemptions lists for agencies help agencies operate more efficiently and allow them to move forward with specific actions deemed to already have no significant impact without “wasting time” on the environmental review process, adding actions as exempt from environmental disclosure on an agency list has important implications. The Environmental Council ultimately has approval authority over any changes or updates to agency lists and must consider the implications of foregoing the process for specific actions or programs, while at the same time considering the impact of losing opportunities to hear public comments on proposed agency actions. For example, the exemption list for the Department of Land and Natural Resources (DLNR) was updated

and signed by the Environmental Council in June 2015. The DLNR list had not been updated since 2010.[15] For DLNR, amendments to the exempt actions included:

> **Exemption Class 3. 1.** Fences around or to manage rare, threatened or endangered plants, covered or open areas for endangered species, game birds and mammals, auxiliary buildings for food or equipment storage, incubators and brooders, open-top breeding and release pens, field aviaries, and hacking boxes, and for watershed and native forest management and restoration. Fences shall contain step-overs or other features that permit pedestrian access for cultural and recreational use. (DLNR Agency Exemption List, 2015)

In the past, any management requiring the building of fences required, at the very minimum, an EA (with a 30-day comment period). By adding fencing as an exempt class of action for the agency, public input has been diminished and the potential to include community member input in management decisions reduced. This is especially significant in areas such as the popular hunting grounds within the Kohala Mountains, in the northern portion of the Island of Hawai‘i as well as the Hāmākua and Laupāhoehoe forests on Hawai‘i, where there has been a history of opposition to fencing because of its impact on access (Josayma & Burgett, 1996).

5.5.2 Court-Mandated Consultation or Mediation

Court-mandated efforts between management groups and a public party have been another way to "facilitate" consultation between managers/partners and surrounding community stakeholders. Mandated mediation, however, often concentrates on negotiating a settlement between parties, often focusing on choosing between either a win-lose negotiation battle or caving in to avoid conflict rather than the possibilities of mutual-gains negotiation, or integrative negotiation (Fisher, 1987). Fisher argues that bargainers can (and should) look for negotiation strategies that will support both sides, and that "by listening closely to each other, treating each other fairly, and jointly exploring options to increase value, negotiators

[15] Compared with other state agencies, the DLNR has updated its list quite frequently. The Honolulu Department of Land Utilization for example, has not updated its list since 1981.

can find ways of getting to yes that reduce the need to rely on hard-bargaining tactics and unnecessary concessions" (Shonk, 2017, par. 2).

5.5.3 Consultation through Social Stand-Offs

Although there is no formal name for this type of consultation, information sharing during in-person confrontations (including blockades, or interactions occurring during on-the ground interface between resource managers or their official partners and members of the communities where they work) does occur from time to time. While social stand-offs may seldom be discussed throughout literature on community outreach or suggested as a meaningful information gathering strategy, it is clear that much insight may be provided by an examination of this phenomenon. Informal consultation strategies such as "talk story" sessions are commonly employed in local context to mediate and bridge disconnections between institutional policies or agents and community stakeholders in Hawai‘i.

CHAPTER 6: FINDINGS AND ANALYSIS

Results and findings in this section are reported by partnership (and not always for the entire HAWP) when data are publicly available, but as aggregated results (to protect individual partnership anonymity) when the data were obtained by the Author either via interviews or the electronic questionnaire. The findings report the results of the evaluative framework outlined in Chapter 3 (Methods). For each of the four rationales, the evaluative questions are repeated, and followed by results, by indicator, in the following sub-sections. In most instances, the data were collected by the Author through either in-person interviews, the structured questionnaire, or extensive archival research. In some instances, outputs that were expected were unavailable (for example in Section 6.3.4, where it was intended to track increasing non-State matching funds as demonstrative of increased efficiency). Where no data were available for a specific indicator, suggestions for appropriate ways to capture performance over time were highlighted.

6.1 Equity

Who gets to participate in the decision making if partnerships are only made up of landowning partners, even when these decisions eventually may impact non-member stakeholders either on immediately adjacent lands or even ones further down-slope? The following sections present the analysis for the four indicators identified for the equity assessment: Outreach and Education Strategy (Section 6.1.1); Landownership Requirements (Section 6.1.2); Representation (Section 6.1.3); Consultation Strategies (Section 6.1.4; Involving the Public (Section 6.1.4.1); and Overall Organizational Inclusiveness (Section 6.1.5). The assessment ends with a summary assessment of the extent to which Hawai‘i’s watersheds are effectively managed from an equity rationale. The evaluative questions outlined in Chapter 4:, for the equity rationale evaluative framework (Section 4.5.1) are as follows:

- Has the Program developed an outreach education strategy and/or invested time or resources into such a Program?

- Are there any landownership requirements to become a member of the Program?
- How does representation in the Program impact decision making in Hawai‘i’s partnerships?
- What does the partner representation in the membership look like?
- Are partners from various sectors?
- What types of consultation strategies has the Program used to engage the local community where they conduct their work?
- How is feedback from non-partners collected?

6.1.1 Outreach and Education Strategy

- *Has the Program developed an outreach education strategy and/or invested time or resources into such a Program?*

Per interviews with partnership coordinators, funding for education and outreach programs (especially funding for personnel for those activities) has been difficult to generate. State DLNR funding is disbursed to focus on management activities only. Of the eight partnerships interviewed, only one (EMWP) reported having a paid staff position for an outreach coordinator as of 2017, though two other partnerships had staff dedicated to this task in the past. The majority of the partnerships still conduct educational and outreach efforts (a total 75% of the partnerships), but those efforts are led by the partnerships’ coordinators and staff (at KMWP, KWP, TMA, MKWP, and WMWP). Since the field work for this research was completed, a statewide Outreach Coordinator has been retained (January 2018) to promote the visibility of the Association.

In regard to a clear outreach strategy being outlined on the partnerships’ individual websites, 8 out of 10 partnerships specifically provide links and information about how to become more engaged in the areas they manage and the activities the partnerships conduct.

6.1.2 Landownership Requirements

- *Are there any landownership requirements to become a member of the Program?*

While there are no written documents or legal mechanisms that outline landownership requirements for membership into the partnerships, landownership in the areas managed is a general policy for all partnerships. As a general (informal) rule, the minimum requirement for membership is set at 1,000 acres in most partnerships. The reasoning behind including only major landowners as partners is twofold: (1) upper watershed areas (places where most management work is conducted) consist of large parcels of lands typically owned by large landowners. These areas are typically within the State's conservation district and rarely accessible to non-landowners. (2) It is understood that partners in the WPs bring with them a set of expertise, as well as a certain amount of resources that could be made available to watershed management. Non-landowners might have less of an incentive or means to participate in this regard. Conservation areas are all located relatively far from urban centers, where landownership is much more fragmented.

6.1.3 Representation

- *How does representation in the Program impact decision making in Hawai'i's partnerships?*
    - *What does the partner representation in the membership look like?*
    - *Are partners from various sectors (public-private-non-profit)?*

As discussed in Chapter 5:, there is substantial representation from the private sector in Hawai'i's partnerships. However, the 50 private members in the partnerships represent a very limited portion of the public (see Table 6-1). There is also significant public-sector representation, but limited membership from national or local NGOs. In terms of equity, it should be noted that Hawai'i's partnerships are restrictive because of the location of protected areas, and is also driven by the pooling of resources of partnership members. Representation by sectors hence seems well-distributed, but essentially only mirrors the uneven landownership distribution in the State of Hawai'i, where 48% of all lands are owned by private holders, of which more than 30% are owned by 50 private landowners (DBEDT, 2015, and analyzed by Author).

Table 6-1: Representation by Sector

	Total Number of Partners	***Percent of Total***
Private	50	47.2%
Public-State	24	22.6%
Public-Federal	15	14.2%
Public-County	8	7.5%
NGO- National	6	5.7%
NGO- Local	3	2.8%
Total	***106***	

Source: Author, based Coordinator Interviews, Management Plans, and partnerships' websites.

6.1.4 Consultation Strategies

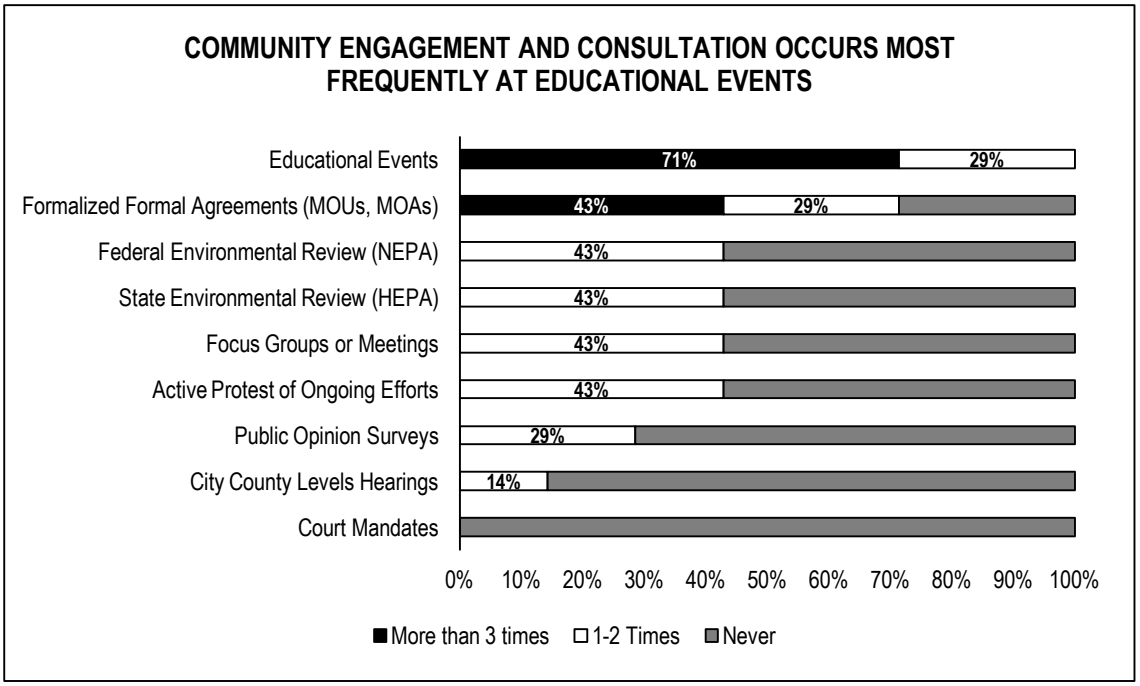
- *What types of consultation strategies has the Program used to engage the local community where they conduct their work?*
    - *Are consultation efforts largely mandated by law, or are they initiated by the Program at will?*
    - *How is feedback from non-partners collected?*

Consultation with non-partner stakeholders may be mandated by law (such as required consultation in the environmental review process, mandated by the courts in some instances, or public hearings for permit applications), and also occurs through a variety of avenues. These include formal agreements with non-partner community groups or individuals, such as through memorandums of understandings (MOUs) or agreements (MOAs), wherein communications and understandings are reached in writing, thereby promoting greater understanding. Educational events also can serve a means for communication and consultation with non-partner stakeholders, as well as planned focus groups or public opinion surveys aimed at gathering input from community members. Finally, a less conventional, yet at times effective, mechanism has been through input received from social stand-offs or protests. This sort of communication has not necessarily always been forceful (even though at times confrontations among hunter groups and partners have in fact sometimes been heated), and include physical opposition (by blocking), media outcries, and legislative testimonials.

When asked about the frequency with which each partnership has received feedback from non-partner community members through nine types of techniques via Program-wide structured questionnaire), coordinators reported that input via educational events and through formalized agreements occurred most often (see

Figure 6-1). Interestingly, neither of those methods are mandated means for initiating conversations between the partners and non-partners. All but one of the Partnership Coordinators surveyed (one skipped that question) mentioned having received feedback from non-partner community members at least once in the last five years. Some feedback from non-partner members has also been received through mandated state and federal environmental review processes (43% of the partnerships indicate that these two strategies have led to them actually receiving comments). Finally, 43% of the partnerships also said they received feedback from non-partner community members at focus group meetings held by the partnerships, and another 43% through active protest of ongoing efforts.

Figure 6-1: Consultation in Hawai'i's Partnerships in the Past 5 Years

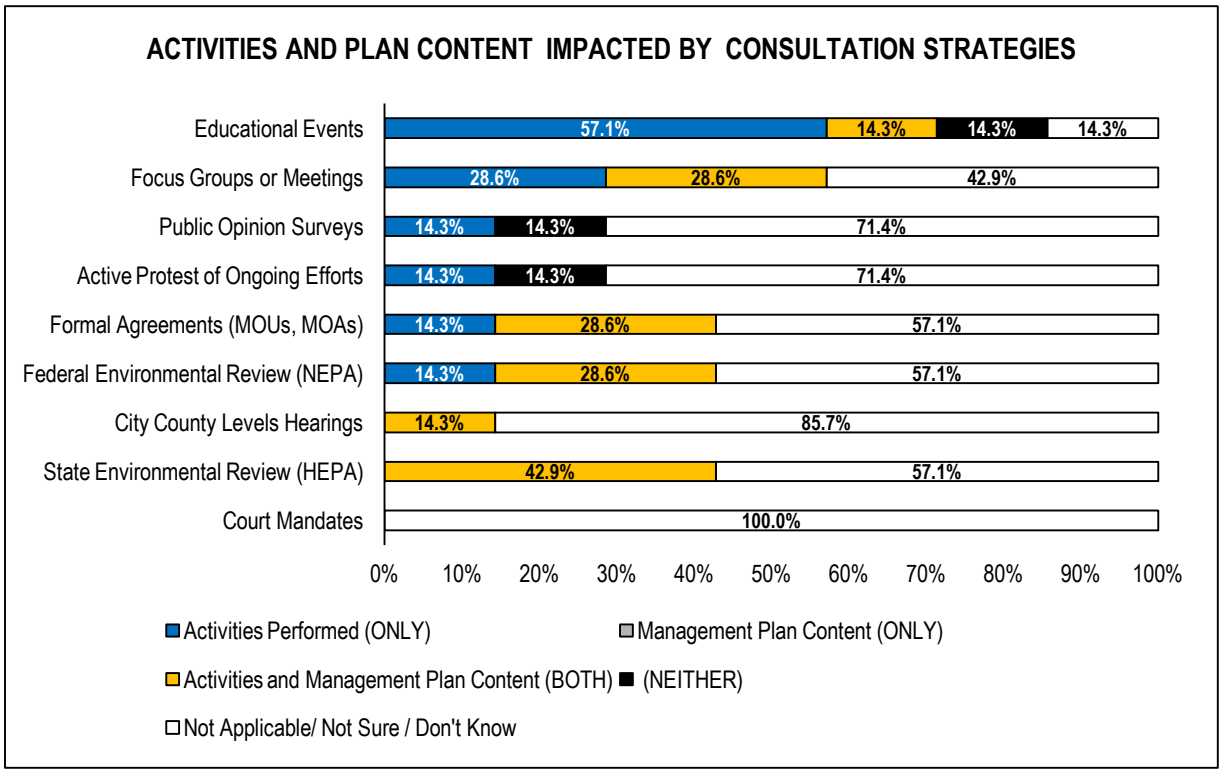


Source: Compiled by Author from structured questionnaire.

Nevertheless, the fact that the partnerships received feedback from some non-partner community members does not necessarily mean that community concerns were systematically researched, heard, and/or taken into account. Respondents were therefore asked what happened to (or what was affected by) the feedback that was received. Essentially, for a consultation initiative to be effective, the information gathered through it would lead to changes in either the group's management plan and/or the activities it conducts on the ground. In fact, one participant suggested that "Most of the consultation we seek is with other land managers or researchers who have expertise in a particular issue we are working on." This suggests that for at least one of the partnerships, consultation has a utilitarian purpose and is not necessarily conducted under normative ideals.

In the next assessment of consultation strategies, respondents were asked whether those same nine consultation strategies actually influenced: 1) activities the organizations performed; 2) content of management plans; or 3) both. Overall, feedback received at educational events was reported as having most impacted the activities watershed partnerships perform (57% of respondents stated that the community feedback actually impacted their choice of activities, and another 14% reported this type of feedback led to change in both activities and also management plans). Nearly thirty percent of the partnerships reported that feedback received from focus group efforts led to changes in activities, and an equal percentage said it affected both activities and management plans. Forty-three percent of the partnerships reported that feedback from state environmental review (HEPA) led to changes to both their activities and their plans (see Figure 6-2).

Figure 6-2: Consultation Impact on Activities in the Past 5 Years



Source: Compiled by Author from Program-wide structured questionnaire.

6.1.4.1 Involving the Public

Assessing the degree to which non-partner community members are participating in, and learning from, educational outreach events would best be conducted by: 1) keeping track of how many community members participate; and 2) actually asking the participants about their experience. Unfortunately, because of limited funding and resources, the partnerships have only recently started to track some of these metrics. Since 2014, WPs have begun to report total hours of volunteer contribution to DLNR's WPP. While such data say little about the volunteer experience, they do show an increase of total hours from 2014 to 2016, which is interpreted to convey the notion that, overall, partnerships are reaching more people (see Table 6-2).

To capture whether the experience actually impacted or satisfied participants, pre/post experience surveys could be administered at outreach and educational events. This task would be much more time- and

resource-consuming than simple counts, but capturing data about volunteer experience (e.g., focusing on what they learned from the experience and whether their interest has grown relating to conservation activities) could be an excellent tool for management to use when applying for education and outreach funds. The degree to which outreach has actual impact in communities is always a challenging metric to capture, though certainly a worthwhile investment.

Table 6-2: Volunteer Contributions (hours)

	2014	2015	2016	Total (hrs.)
Waiʻanae Mountains (WMWP)	4,478	420	3,688	**8,586**
Leeward Haleakalā (LHWRP)	1,718	N/A	370	**2,088**
West Maui Mountains (WMMWP)	52	142	1,516	**1,710**
Koʻolau Mountains (KMWP)	167	535	486	**1,188**
Three Mountain Alliance (TMA)	88	403	696	**1,187**
East Molokaʻi (EMoWP)	127	201	153	**481**
Kohala (KWP)	N/A	210	210	**420**
Mauna Kea Watershed (MKWA)	N/A	107	N/A	**107**
Kauaʻi Watershed Alliance (KWA)	N/A	N/A	N/A	**N/A**
East Maui (EMWP)	N/A	N/A	N/A	**N/A**
Total	**6,630**	**2,018**	**7,119**	**15,767**

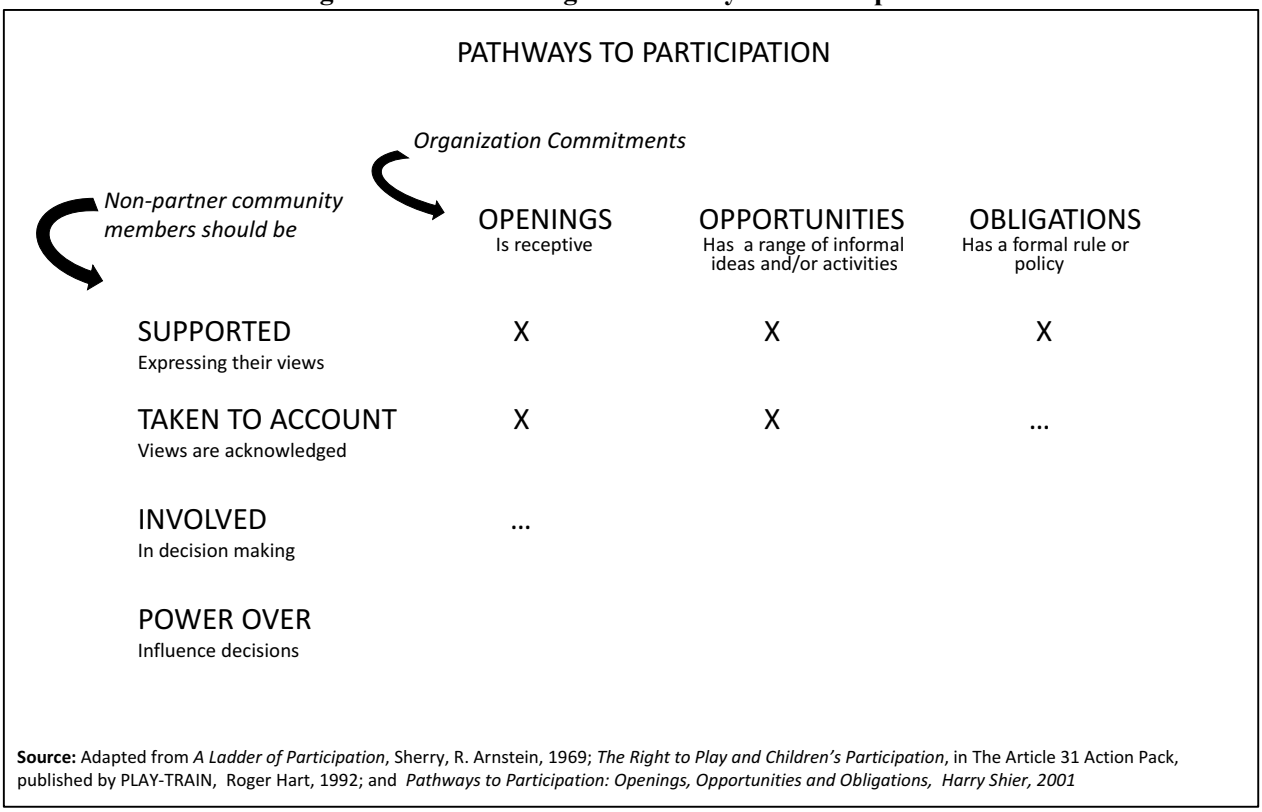
Source: Compiled by Author from annual legislative reports.

6.1.5 Overall Organizational Inclusiveness

- *How are non-partners included in the choice of activities the Watershed Partnerships perform, and in the plans, they draft?*
- *Are consultation strategies, and feedback received from various consultations with non-partner community stakeholders, actually impacting decision making?*

As was outlined in Chapter 4: (Section 4.5.1.7), assessing overall "inclusiveness" of the organization involves measuring organizational commitments as well as overall openness to participation. Overall, the "Pathways to Participation" scale sought to situate each partnership in regard to (1) whether or not they are receptive to receiving non-partner community feedback (organizational openings); (2) whether or not they have a range of formal or informal ideas and/or activities to promote the inclusion of community ideas in their everyday activities; and (3) whether or not they have formal policies or rules that mandate involvement of non-partners in their decision-making process (organizational commitments).

Figure 6-3: Reasoning for Pathways to Participation



The survey questionnaire asked: "Please tell me about your Watershed Partnership's attitudes and approaches for each of the four possible actions below to receive feedback from non-partner community members over the last five years?" The four possible actions were: 1) Helping non-partner stakeholders express their views; 2) Taking non-partner stakeholder views into account; 3) Involving non-partner stakeholders in our decision-making process (such as planning activities or setting goals); and 4) Allowing non-partner stakeholders to share power and responsibility of decision-making with us. For each of those four actions, respondents were asked to select all that apply from these options:

- We have a range of informal ideas and/or activities to address this
- We have a formal rule, or policy that says we must do this
- We do not support this idea
- Don't know/ Not sure

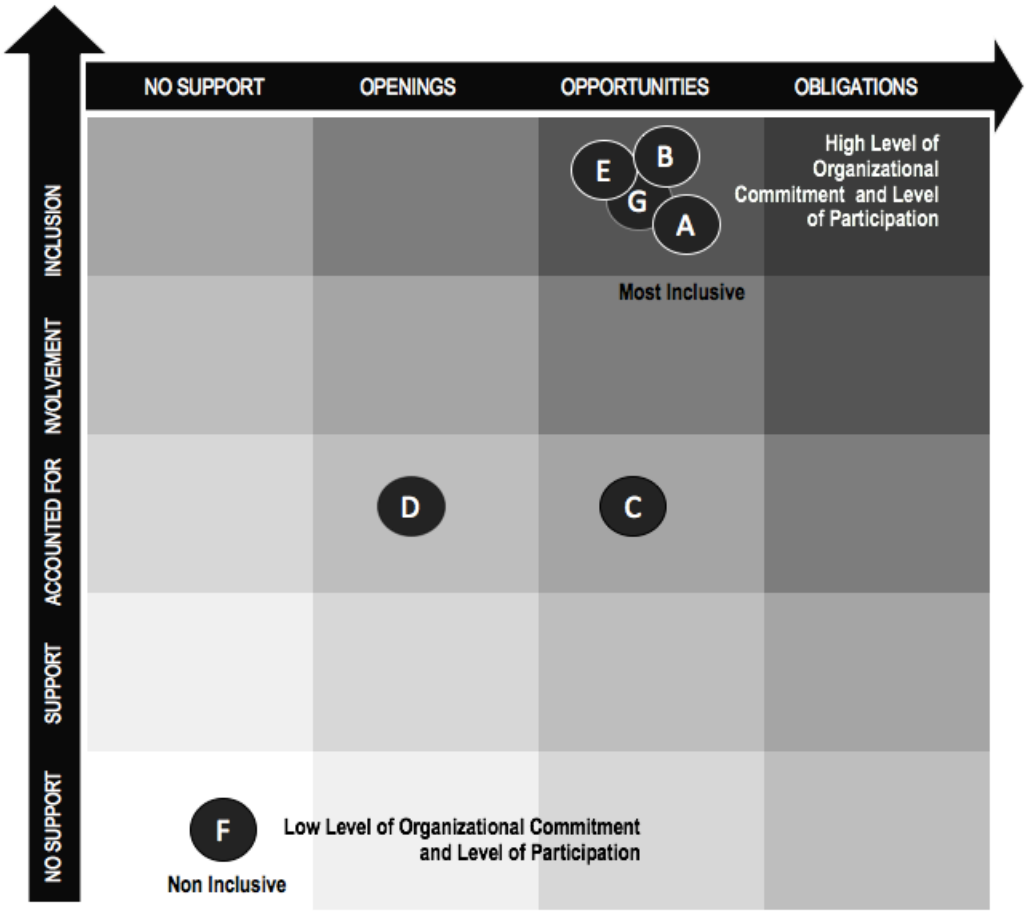
The analysis for overall inclusiveness sought to assess: 1) organizational strategies that enable or mandate participation in each of the partnerships by looking at policies or existing institutional rules in their partnership; as well as 2) considering how the groups actually perceived their efforts to accomplish this (see Figure 6-3). For "Pathways to Participation," respondents were considered more inclusive when they said they did one or more of these things: taking non-partner stakeholder views into account; involving non-partner stakeholders in the decision-making process; and/or allowing non-partner stakeholders to share power and responsibility of decision making with current partners. On the organizational openings scale, they also scored higher when they responded that they were receptive to receiving non-partner community feedback; had a range of formal or informal ideas and/or activities to promote the inclusion of community ideas in their everyday activities; and/or had formal policies or rules that mandate they must involve non-partners in their decision-making process. The responses were coded and graphed as seen below (see Figure 6-4). Letters from A-G were given to each partnership who answered this question (one participant skipped this question) in order to protect the anonymity of each Coordinator.

Results for this assessment indicate many of Hawai'i's WPs have a high level of organizational commitment to participation (a true, intrinsic desire to include non-partner-community members in Program activities). Most also provide opportunities for non-partner community members to offer opinions about WP activities, but none actually have formal obligations or policies that mandate they do so.

One respondent is clearly less positive about the idea of non-partner participation on Partnership activities and/or decisions. In open-ended comments, one respondent revealed that:

> Many of the large landowners in Hawai'i, including within our partnership, are hesitant to seek public input in the decision-making process for projects on their lands. The most prominent reasons I have heard for this are because they feel suggestions they have received in the past would have unrealistic costs associated with them, or open them up to unreasonable liability. Many of these organizations have their own internal decision-making process[es] which often do not include public input except when required by law.

Figure 6-4: Pathways to Participation Results



Source: Assessment by Author of seven WPs responding to Program-wide structured questionnaire.

The concern about liability (littering, or vandalism) is valid, to some extent. Although opening access across private lands (for invasive species removal for instance) and allowing community members that are not part of the partnership to become involved is one way to make community members feel part of the process, there are concerns associated with increased traffic on private lands, as well as exposure of sacred sites (wahi pana) etc. Although liability is actually not an issue for private landowners or on unencumbered state and county lands (under HRS §520), private landowners are still concerned about how to best manage access across their lands without facing liability threats. Agreements and better collaboration between large landowners and local community groups should be encouraged through guided and managed volunteer groups for example, so that interested local area residents can take part in being the "eyes and ears" of the place, and can feel a sense of ownership in stewarding and supporting management efforts.

Another comment received in the structured questionnaire explained: "*We make an effort to hire from within our stakeholder communities when possible. This has prove[n] to be helpful in establishing flow of information both ways in a more intimate and trusted way*." These sorts of statements reinforce the importance partnership managers place on being a part of the communities in which they work.

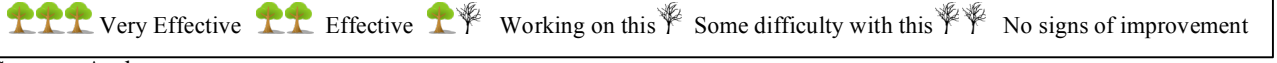
Finally, one partnership coordinator explained: "*While our project hasn't gone through a state or federal environmental review process for any large projects in the last five years, we did receive a lot of public input through those processes [in prior years] and the concerns that were raised are largely still pertinent and do still have influence on our management activities through being incorporated into our management plan*."

6.1.6 Summary Assessment: Equity

The following table (Table 6-3) captures a final assessment of the outputs of the indicators examined in this Section. When assessing the degree to which Hawai‘i's watersheds are effectively managed under an equity rationale, we can see that Hawai‘i's WPs are either working hard on certain aspects of meeting this aim (whether deliberately or not), or already doing this effectively. While exclusive, in regard to membership, in the case of Hawai‘i's WPs, there is an apparent attempt by individual partnerships to engage non-partner community members in management activities and to foster greater conservation values in the communities in which they work in the process. Furthermore, Coordinators unanimously report (in interviews) having developed close relationships with local area residents in the areas they manage, and all specifically stress the importance of this.

Table 6-3: Effective Watershed Management from an Equity Perspective

INDICATORS	SUMMARY ASSESSMMENT
Outreach and Education Strategy 	While only one partnership has a paid position for an Outreach Coordinator at this time, most of the partnerships (6 out of the eight partnerships interviewed for this research) are currently engaged in education and outreach activities. Some offer volunteer hikes, planting opportunities, while others work with local area elementary, middle or high schools to arrange for educational experiences for local area students. The two partnerships who do not currently conduct outreach activities do not as the areas they manage are simply too difficult to access (accessible only by a long day or two hike, or helicopter). It is not practical of sensible to involve persons that are either young or inexperienced. Partnership websites show, however, that 8 out of the 10 partnerships do indeed have formal mechanisms for organizing volunteer outreach and educational events. Finally, a statewide outreach coordinator has recently (January 2018) been retained to advance the visibility of the Program and reach out to a greater number of non-partner community members.
Landownership Requirements 	Although no formal membership requirements exist to become a member of the individual partnerships; all current partners are landowners within the management area (typically owners of more than 400 acres). Of all the Coordinators, none of them can recall someone ever requesting to become a member.
Broad Representation by Various Sectors 	There are partners from various sectors in each of the individual partnerships, however representation from the private sector is almost half of all members overall (47.2%). While private-sector representation is large, these members are large landowning partners who may have different goals or values than non-landowning local area residents living on lands immediately adjacent to larger parcels where management activities occur. The non-profit sector is also under-represented in the Association, with a total of 5.7% representation from national-level NGOs and only 2.8% local NGOs.
Impact of Consultation Strategies: 	In order to assess the degree to which non-partner community stakeholders have been consulted about management activities occurring within their community watersheds, partnerships were asked about the strategies they have used to gather feedback from those stakeholders. Feedback received through outreach and educational events, focus groups, as well as through environmental review processes have impacted WP activities and goals.
Involving the Public (volunteers) 	Involving volunteers can be difficult since most of the areas managed by the partnerships are remotely located at high altitude, which are at often steep and difficult to access. Almost all the partnerships have nonetheless developed mechanisms to engage non-partner community stakeholders in their activities, sometimes even arranging for volunteer events offsite (for example planting trees, or invasive plant eradication in lower elevation areas. Volunteer hours reported to DLNR/DOFAW have increased from 2014-2016, however, measuring progress over a shallow two-year timeline has its limitations. Volunteer hours also reveal little about the volunteers' experiences (whether the activity actually had an impact on them, such as instilling a greater sense of care and responsibility, or increased understanding about conservation.
Organizational Inclusiveness: Pathways to Participation 	Pathways to Participation results illustrate that all but one of the partnerships have a high level of commitment to participation. This means that for at least four of the seven partnerships, a commitment to participation surfaces from the support of non-partner community members expressing their views; open to taking their views into account; the idea of involving those stakeholders in the decision-making process; and welcoming their potential influence in decision-making (inclusion). Two partnerships only commit to non-partner community members being heard (solely accounted for). One partnership, however simply does not support the idea of non-partners participating in their activities or influencing the process. Secondly, on the scale of organizational commitments to participation (actual openings, opportunities, or obligations), it should be noted that no formal commitment to including non-partner community members has been formalized by any of the partnerships (though opportunities are made available).



Source: Author.

6.2 Deliberative Democracy

Who is included, who makes decisions? How are those decisions made? Are those decisions fair? The following sections present the analysis for the six indicators identified for the democracy assessment: the frequency of partner meetings (Section 6.2.1); the decision-making mechanisms used by each of the individual partnerships (Section 6.2.2); how the partnerships capture their priorities, by investigating the frequency with which they update their management plans (Section 6.2.3); the frequency of deliberative outreach (mandated or not) efforts of all partnerships (Section 6.2.4); how the public has been involved (Section 6.2.5); and whether any regulatory changes have ensued from feedback received from non-partner community members through Program outreach efforts (Section 6.2.6). The assessment ends with a summary assessment of the extent to which Hawai‘i’s watersheds are effectively managed from a deliberative democracy rationale. The evaluative questions outlined in Chapter 4: for the deliberative democracy rationale evaluative framework (Section 4.5.2) are as follows:

- Have the Watershed Partnerships operated fairly?
- How often do partners meet?
- Have laws and regulations changed to mandate greater consultation because of this Program?
- What decision-making mechanisms do WPs use to make decisions?
    - How are decisions made?
    - Who has final say?
    - How genuinely deliberative are the actual decision-making processes?
- How effectively are decisions translated into action?

6.2.1 Frequency of Partnership Meetings

- *How often do partners meet?*

According to partnership coordinators, partnership meetings are held at least quarterly by most individual partnerships, and are well attended. Three partnerships meet only twice a year. While all eight coordinators who were interviewed reported that most partners have very busy schedules, making it difficult to schedule regular meetings, they all attested to the vital commitment of their partners.

6.2.2 Decision-Making Mechanisms

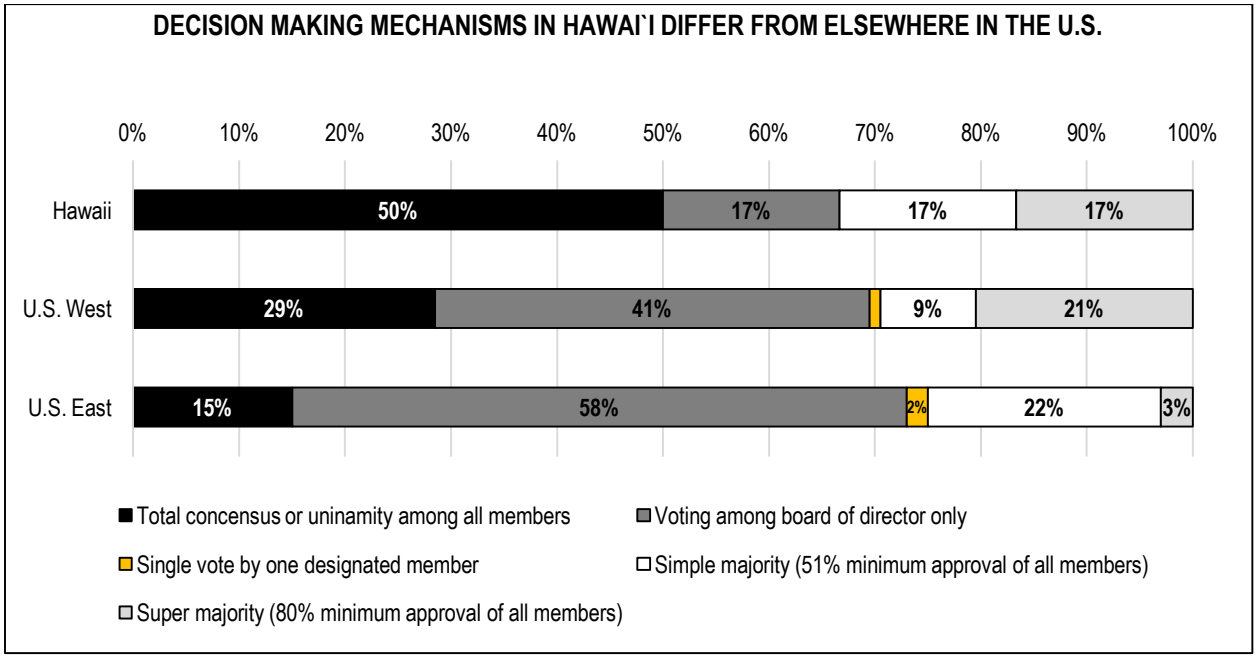
- *What decision-making mechanisms do WPs use to make decisions?*
    - *How are decisions made?*
    - *Who has final say?*

By and large, decisions in Hawai‘i’s Watershed Partnerships are made by group consensus. When asked about what decision-making mechanisms were most often used to make decisions about activities, visions or goals in their respective partnerships, 50% (*n*=4) of the respondents in Hawai‘i’s Partnerships responded that these were made by total consensus of all voting partners. In comparison, decisions in Watershed Partnerships across the United States seem to be most frequently made by vote from an internal committee within the partnership (58% in Eastern U.S. partnerships and 41% in Western ones make decisions by vote among a board of directors only, see Figure 6-5).

Most of Hawai‘i’s Partnerships also have these types of board of directors, but call them Executive Committees. Reaching consensus among a smaller number of members is likely more feasible than in larger partnerships found on the continental U.S. Hawai‘i’s Executive Committees are typically responsible for making decisions on topics or projects already outlined in their management strategies (plans). For other significant or potentially controversial issues, matters are generally brought to the entire group of partners to decide. One respondent explained:

> Once the management plan is approved by the partners, we act within it. The Executive Committee helps to guide decisions on new issues as they come up. If the matter is thought to be significant, it can be taken up by the general partnership and consensus is the goal. A majority vote will take place if it is a difficult issue. (Coordinator Interview).

Figure 6-5: Decision-Making Mechanisms



Source: Compiled by Author from (1) Structured questionnaire; (2) Clarke et al., 2005).

6.2.3 Partnership Priorities

Partnership priorities are outlined in each of their individual management plans. The management plans are necessary in order to qualify for funding from the State's WPP. While not all partnerships have yet updated their management plans, all of them have drafted at least one. Ideally, management plans would each be updated every five years, but, considering the long-term horizon of the Program's activities, priorities rarely dramatically shift from year to year.

Table 6-4: Management Plan Updates

	Year Established	Last Plan	Latest Plan
East Maui Watershed Partnership	1991	2009	In-process
West Maui Mountains Watershed Partnership	1998	1999	2012
East Moloka‘i Watershed Partnership	1999	2008	2016
Ko‘olau Mountains Watershed Partnership	1999	2002	2016
Kaua‘i Watershed Alliance	2003	2005	2012
Kohala Watershed Partnership	2003	2008	In-process
Leeward Haleakalā Watershed Restoration Partnership	2003	2006	In-process
Three Mountain Alliance	2007	2007	In-process
Mauna Kea Watershed Alliance	2010	2010	N/A
Wai‘anae Mountains Watershed Partnership	2010	2015	N/A

Source: Author. **Note:** N/A: Not Applicable (plan still valid).

Management Plans for all of Hawai‘i’s WPs are, however, not all publicly available. From an open and transparent perspective, the fact that they are not made publicly available is less democratic.

6.2.4 Deliberative Outreach

- *How genuinely deliberative are the actual decision-making processes?*
- *How effectively are decisions translated into action?*

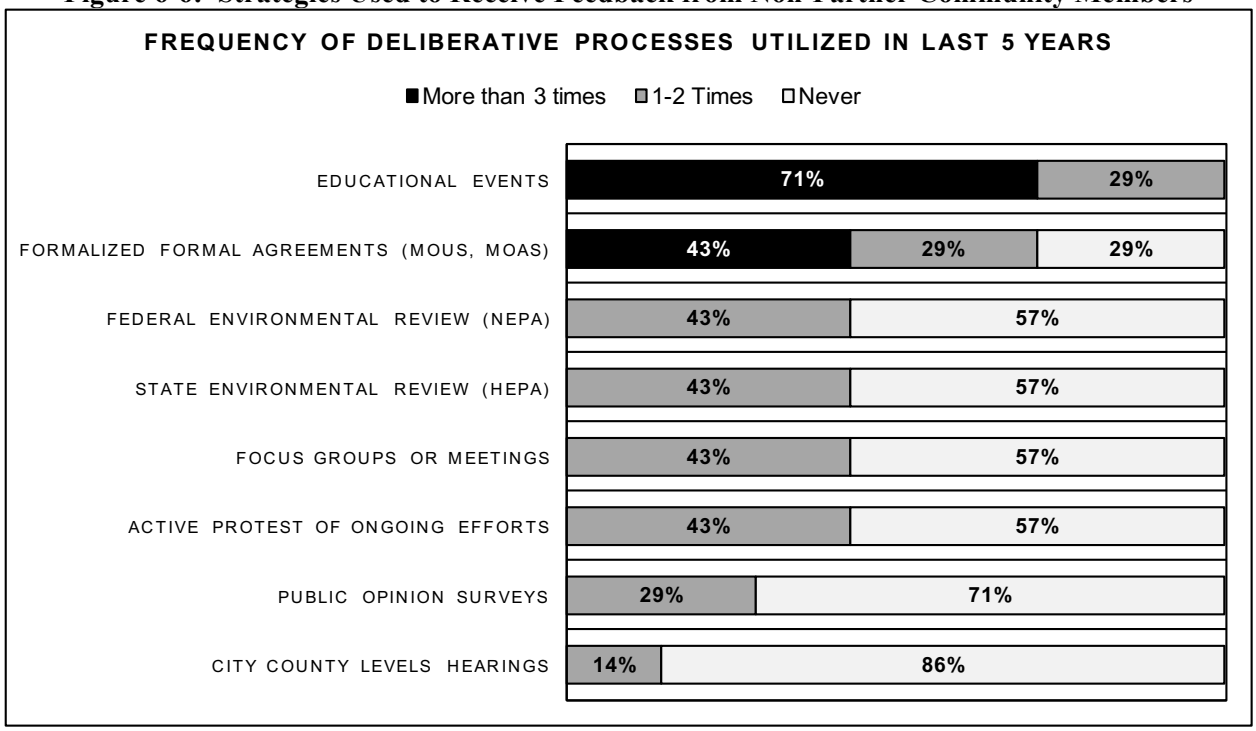
The WPs have conducted community outreach through a variety of mechanisms over the last five years. This assessment explores the strategies utilized by the WPs in which feedback from non-partner community stakeholders was received in the last five years. While this says little about the impact of participating in or promoting these types of strategies on non-partner community members from these outreach events, it does point to potential mechanisms that may be good targets to engage communities in the future. As noted below (Figure 6-6), the most feedback received from non-partner community members has been obtained from educational events, as well as from formalized agreements (MOUs, MOAs) initiated with non-partners. Public hearings and public opinion surveys have not been significant means of gathering input from non-partner community stakeholders in the case of Hawai‘i’s partnerships.

NEPA and HEPA can hardly be considered targeted “strategies” in the end, as they are often long processes mandated for larger projects. They are, however, democratic processes that mandate all comments received be fairly evaluated and responded to.

One respondent explained how their organization seeks feedback from non-partner community members:

> We do not have a formal process. We will sometimes seek input and are sometimes required by law depending on the work to be accomplished or issue to resolve. Outside experts, landowners, managers and community are consulted for their knowledge and asked for support. On public land, actions may be more formal. On private land, it may depend on the landowners’ policies. The wishes of the landowner often drive our ability to engage outside stakeholders.

Figure 6-6: Strategies Used to Receive Feedback from Non-Partner Community Members



Source: Compiled by Author from structured questionnaire.

The processes used to consult with non-partner community members have, however, never been formalized, nor has a process for translating the feedback received into a concrete action been identified.

6.2.5 Involving the Public

As discussed in Section 6.1.4.1, WPs have reported total hours of volunteer contributions to DLNR's WPP since 2014 and that these volunteer hours have increased from 2014-2016. From a democratic perspective, presenting data about increasing number of community/volunteer hours says little about how or why the effort was instigated. Perhaps tracking the types of audiences (aiming for a broad audience to increase representation) would be better suited for this type of analysis. As mentioned earlier, there are presently very limited data available to assess the outreach efforts of Hawai'i's WPs.

6.2.6 Regulatory Change

- *Have laws and regulations changed to mandate greater consultation because of this Program?*

Interestingly, while there has in fact been an important regulatory change in the last five years, that change has ultimately inhibited non-partner community members from directly participating in the consultation process. Under Hawai‘i’s Environmental Law (Chapter 343), any proposed new activity on conservation lands, or the use of State funds upon them, constitutes *triggers* for environmental assessments. As discussed earlier in this research, DNLR (a State agency) amended its exemption list in 2015, with one very important change that ultimately reduces public input. By making fencing exempt from triggering Chapter 343 (as per its agency list), the State DLNR is essentially removing an opportunity to seek feedback from non-partner community members in the areas they conduct activities. Note that the DLNR still has the choice to undergo an environmental review process, and would likely seriously consider doing so should they sense that proposed fencing in certain areas would cause community concern. One was actually published since 2015 on Moloka‘i, conceivably put in motion in anticipation of community push-back.

> “This Environmental Assessment (EA) evaluates the possible environmental and cultural consequences (positive and negative) of the Pāku‘i Watershed Project. Though these project activities are exempt from requiring an environmental assessment, this EA has been prepared so that the community and decision makers have very detailed information about the watershed protection project and the natural and cultural resources of the entire landscape. Future watershed protection projects similar to this one are anticipated for other areas in East Moloka‘i.” (The Nature Conservancy, 2017, p. 2).

On one hand, the State may possibly be seeking to reduce cost by allowing some activities that have generally been routinely conducted without causing environmental harm. Conversely, exempting fencing activities from environmental review and associated opportunities for consultation (a 30-day public comment period for environmental assessments), also reduces the extent of fair democratic opportunity for non-partner community members to provide input.

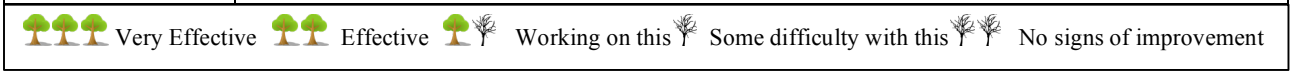
6.2.7 Summary Assessment: Democracy

When assessing the degree to which Hawai‘i’s watersheds are effectively managed under a democratic rationale, Hawai‘i’s WPs appear to have operated in a relatively fair manner. Partners meet regularly, and

they make decisions largely by consensus. Reaching consensus in smaller groups (unlike in WPs in the continental U.S. for example) does seem more feasible. Accessibility (especially online) to all WP Management Plans, as well as formalizing strategies for ongoing consultation with non-partners would make the Program more democratic. Table 6-5 outlines the results of the assessment of Hawai‘i’s WPs under a democratic rationale.

Table 6-5: Effective Watershed Management from a Democracy Perspective

INDICATORS	SUMMARY ASSESSMENT
Frequency and Attendance of Partner Meetings 	Partners in the individual partnerships have been meeting regularly: at least quarterly to discuss partnership priorities and on-the-ground progress. Coordinators report that while most partners are very busy, they are all very committed and send a representative if they cannot be there to attend a meeting. Partnership meetings inform partners of activities but are not closed to the public (though the meetings are not widely publicized widely).
Decision-making Mechanisms 	Decisions among partners are arrived at in most instances (50% of all partnerships) by total consensus among all partners. Most decisions are made democratically, with voting being made by an Executive Board alone in one case, but with a membership-wide vote of a minimum of 51% majority rule in all other cases.
Priorities: Management Plan Updates 	Management Plans for environmental projects are not typically updated often, as the activities and goals outlined in the Plans take several years to complete. Still, four of the WPs have updated their Management Plan at least once; four are currently in the process of updating their last draft; and two are not currently working on an update. Management Plans are also not all readily accessible to the public.
Deliberative Outreach 	Feedback is received from non-partner community members has occurred most often at outreach/educational events of through formalized agreements such as the signing of a MOA or MOU with non-partners. There is however no formal process in place that would formalize an ongoing consultation strategy with non-partner community members, nor is there currently a formal system in place that would direct how to incorporate the outcomes of these deliberative processes into the organizations plans and activities.
Involving the Public 	Data on the nature and type of audiences reached through outreach or at educational events (or through other means of consultation) would be useful to assess the democratic merits of the WPs. We know that volunteers do participate in various outreach and educational activities (and that volunteer hours have increased from 2014-2016.) However, we do not have information on who these people might be (are they the same people coming back each week, or new groups, more or less representative of the local area community?)
Regulatory Change 	In 2015, the DLNR updated its agency exemption list (under HAR Chapter 11-200) such that fencing activities no longer trigger the State’s environmental law (Chapter 343) potentially reducing stakeholder input from consultation through environmental assessment. While DLNR can choose to undergo environmental review (and has since, as seen Moloka‘i in 2017 for the Pāku‘i Watershed Project), this change in law could potentially reduce the deliberative efforts of the WPs.



Source: Author.

6.3 Efficiency

This section's assessment looks at the efficiency (and to some extent effectiveness) of HAWP's partnerships. The following sections presents the analysis for the four indicators identified for the efficiency assessment: the partners' investments, to see whether they have grown over time (Section 6.3.1); whether state funding has remained small (or preferably declined) while at the same time demonstrative of efficient use of funding by looking at whether more activities are being conducted that lead to favorable environmental outcomes (Section 6.3.2); indications of partnership staff increasing over time (Section 6.3.3); and whether state funding has been increasingly leveraged through cost matching (6.3.4). The assessment ends with a summary assessment of the extent to which Hawai'i's watersheds are effectively managed from an efficiency rationale. The evaluative questions outlined in Chapter 4: for the efficiency rationale evaluative framework (Section 4.5.3) are as follows:

- To what extent have partners pooled resources?
- Has State funding remained consistent? Or preferably declined?
- Have the Partners' cost-share increased over time?
- Have increasing sums of monies been invested?
- Have individual partnerships grown?
- Is State funding being increasingly leveraged?
- Is the State's investment showing signs of improvement?
- Have partnerships with the greatest share of State funding been able to conduct more activities?

As previously discussed in Section 4.5.3, data for some of these metrics are either unavailable or questionable. Therefore, this section analyzes such data that are available, and offers occasional observations on how a better, or "ideal" analysis could be done with valid, available measures.

6.3.1 Partner Investment

- *To what extent have partners pooled resources?*
- *Have increasing sums of monies been invested?*

To look at individual partner investments and assess how they might have grown over time would necessitate data from all 106 individual partners in the WPs. Unfortunately, as mentioned earlier, data on individual-level contributions (be it financial, manpower, or in-kind resources) into the partnership are not collected at this time. Such an effort, however, would be a good way to assess the extent to which partners have actually pooled resources and committed to this effort. At this time, there is no standardized mechanism in place that captures partner contributions. Such a mechanism could be initiated by the state's WPP and reported in DLNR/DOFAW's Annual Reports to the Legislature. The data should include amount of monies contributed, equipment shared, space provided (for storage of equipment for example), and any other contribution made either in time hours, financial payment or acreages.

6.3.2 State Funding

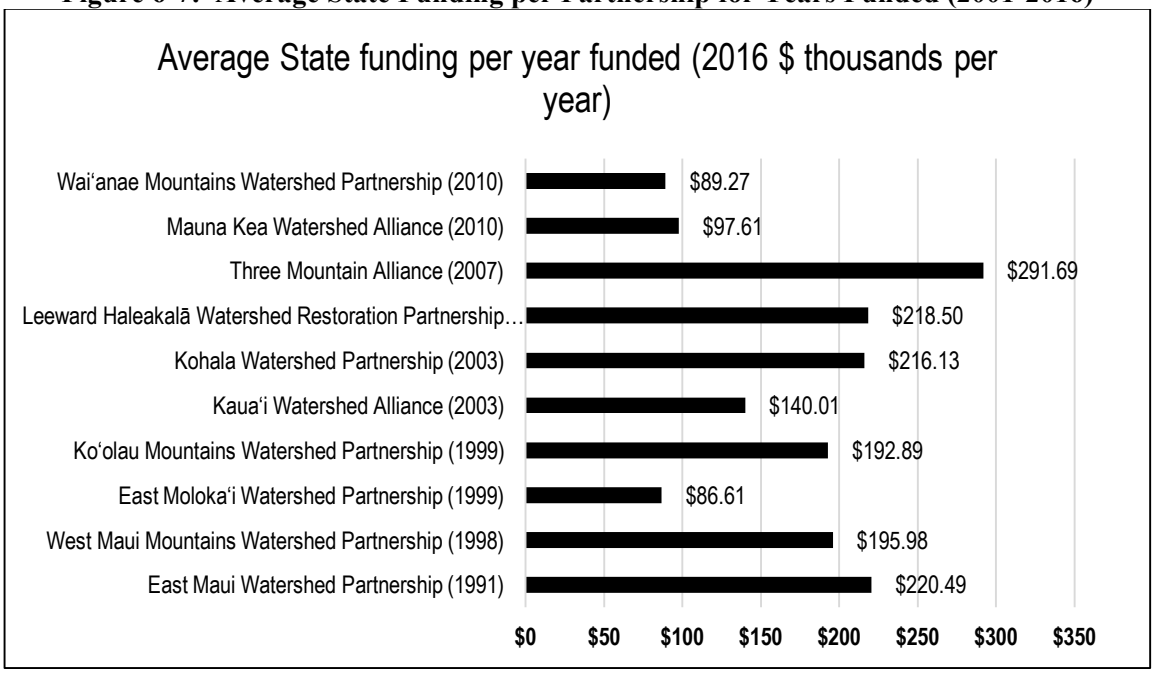
- *Has State funding remained consistent? Or preferably declined?*
- *Is the State's investment showing signs of improvement?*
- *Have partnerships with the greatest share of State funding been able to conduct more activities?*

While increasing amounts of State funding for conservation activities demonstrate a general commitment to conservation and supports the goal of this WP, under a pure efficiency rationale State funding should remain flat or constant, or at least not increase significantly over time, since partner resources are increasingly being leveraged and thus, the State's role should not increase. State funding should support greater collaboration and encourage the leveraging of resources, not simply sustain the long-term livelihood of the Program. In this case however, the state is not only a funder, but also a partner, creating expectations that the state's share should not increase at all may be too exigent. Additionally, as population continues to increase, causing greater environmental pressures, a non-growth model may not entirely be realistic. Finally, new partnerships have formed, which also results in greater demand for funding. I nevertheless conduct the assessment under the efficiency model utilizing low to moderate growth as a representation of an efficient allocation of state funding based on my literature review. The analysis to follow ignores some

concerns about data availability noted in the following Section 6.3.5 yet would likely be part of an ideal analysis if the data were more trustworthy.

For the ten WPs still in operation (excluding Lānaʻi), average State funding by partnership per year funded – calculated in constant 2016 dollars using the Honolulu Consumer Price Index to control for inflation – has ranged from a low of about $86,600 for East Molokaʻi to a high of about $292,000 for Three Mountain Alliance. Average State funding by partnership has ranged from about $85,000 to a little less than $265,000 per year since 1991. Average funding per year for each partnership was calculated based on the number of years funded for each of the individual partnerships (see Figure 6-7). Three Mountain Alliance, the largest of all partnerships, has received the highest annual average share, as well as the largest overall total amount.

Figure 6-7: Average State Funding per Partnership for Years Funded (2001-2016)

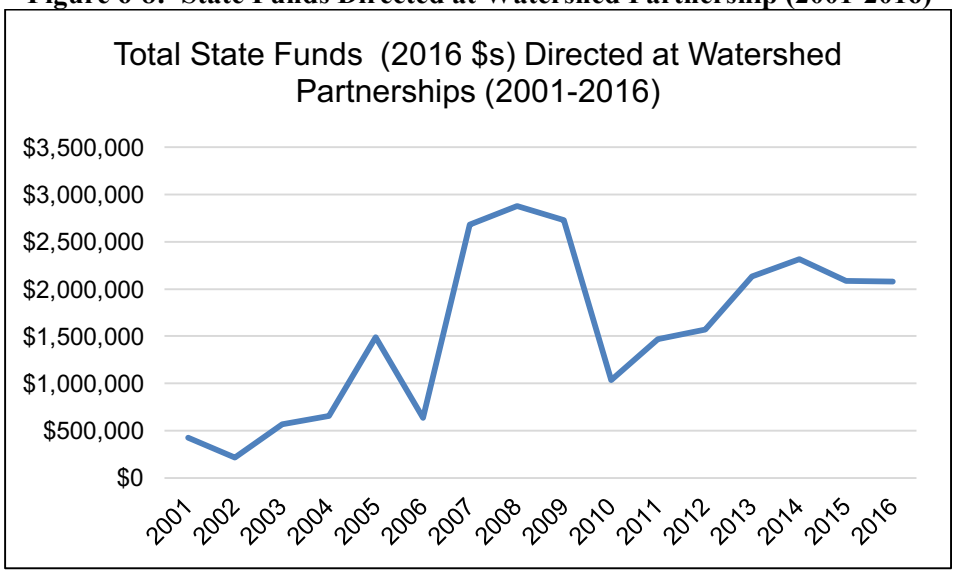


Source: Compiled by Author from annual legislative reports, then converted to constant 2016 dollars (Honolulu CPI).
Note: Funding per year based on number of years in operation; initial year indicated above.

Over time (from 2001 to 2016, the only period for which funding data were available), the State's overall funding has fluctuated, declining after the Great Recession of the late 2000s, and reaching a rough plateau of around $2 million in constant 2016 dollars (see Figure 6-8). Clearly, the passing of the Legacy Land Act (House Bill 1308 CD1) in 2005 added a significant amount of funding for the WPP, as did the 2011 "Rain

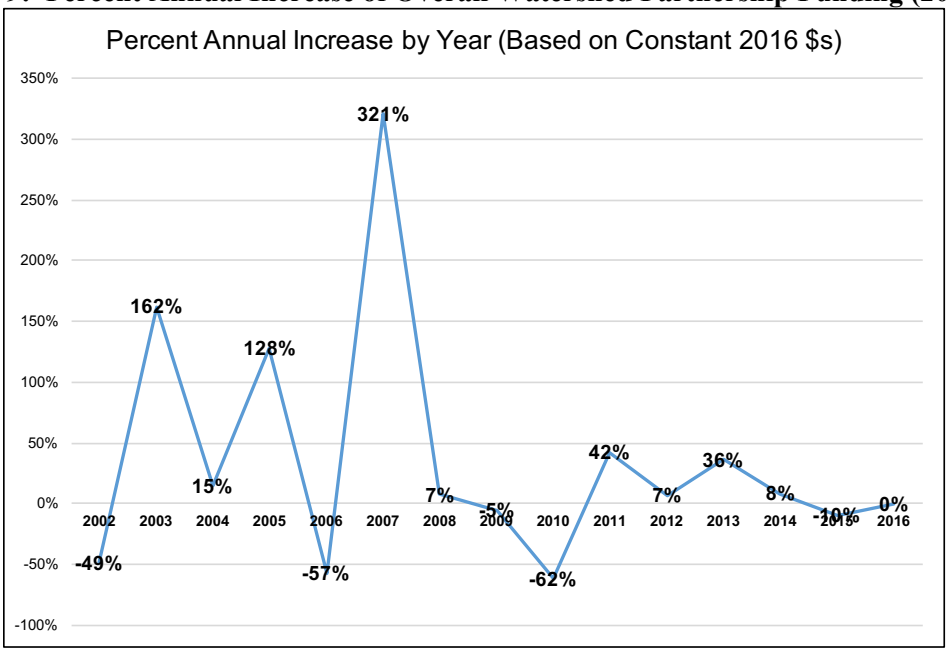
Follows the Forest" initiative – at least until 2015, when funding was returned to a line item in DLNR's overall operating budget and is no longer provided through a special fund. Hence, government (State) funding for the WPs has indeed decreased. From an efficiency perspective, this shows that the State has recognized that it does not need to continue to increase funding for this Program, possibly on the rationale that that investments made to date should lead to higher levels of cost-sharing and leveraging of these funds.

Figure 6-8: State Funds Directed at Watershed Partnership (2001-2016)



Source: State DLNR/DOFAW Annual Legislative Reports (2001-2016). Analysis by Author.

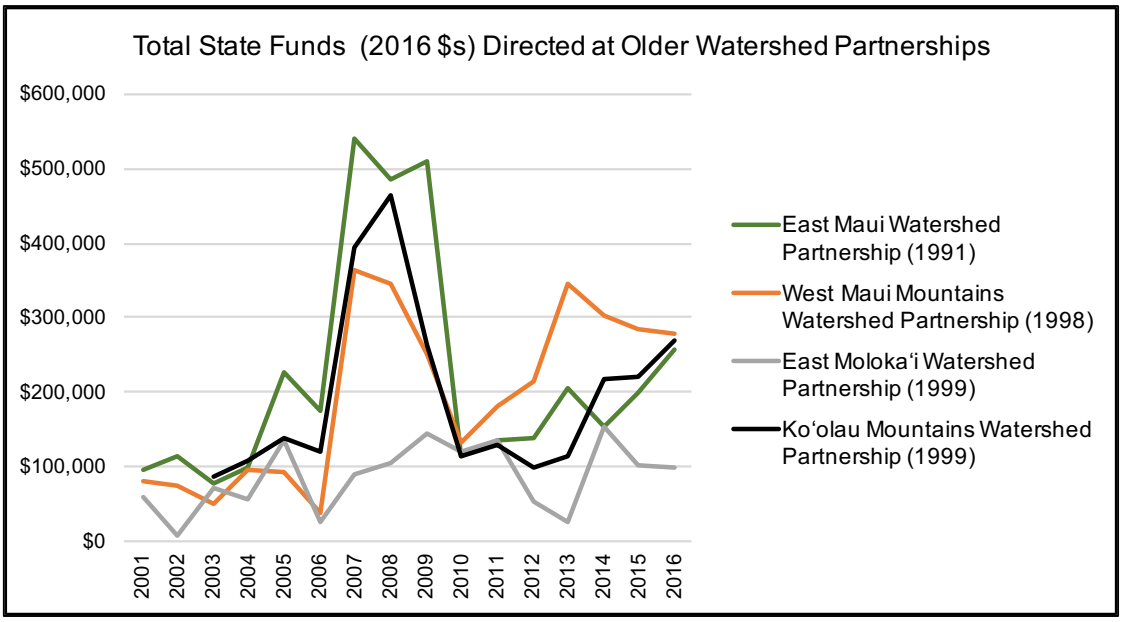
Figure 6-9: Percent Annual Increase of Overall Watershed Partnership Funding (2002-2016)



Source: State DLNR/DOFAW Annual Legislative Reports (2001-2016). Analysis by Author.

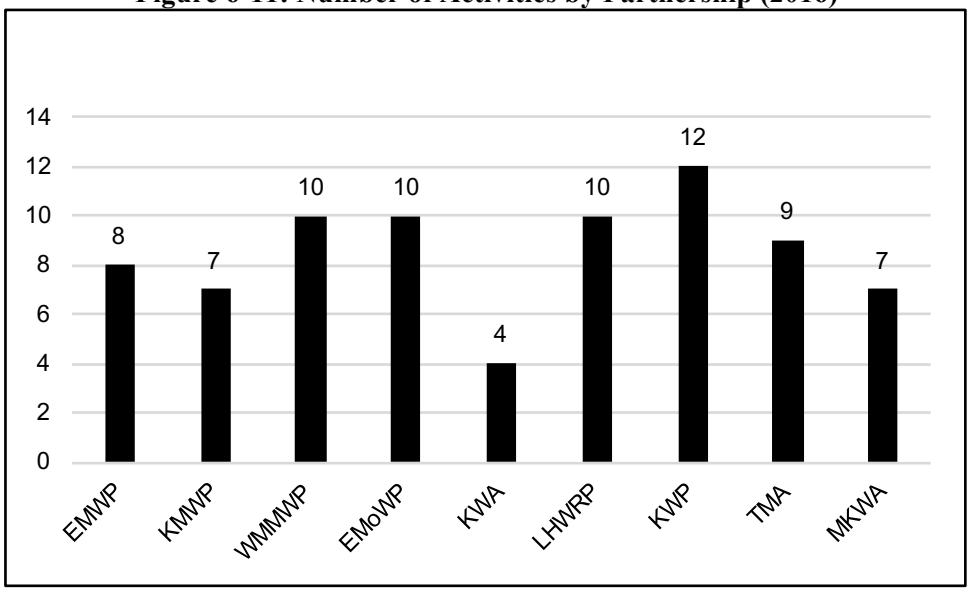
We may also note if there has been any tendency for evidence of "efficient" State investment by examining individual figures for just the older WPs, those created in the 1990s. Results in Figure 6-10 indicate that funding for these WPs has generally followed the overall pattern for all State funding in the preceding chart – with the possible exception of EMWP, the least well-funded of all WPs. Thus, the theoretical efficiency goal of declining State investment would not appear to be attained; rather, funding seems a matter of available total State resources and changes in overall policy.

Figure 6-10: State Funds Directed at Older Watershed Partnerships (2001 – 2016)



For the State investment to be efficient *and* effective, funded watershed efforts should also show signs of improvement. Maximum "on-the-ground" improvements should be commensurate with greatest overall investment. Partnerships with the highest share of State funding should be conducting more activities – and TMA, the most well-funded partnership, should be conducting the most activities. At this time, the KWP (Kohala) conducts the highest number of activities (a total of 12). KWP, however, has been the fourth best funded on average per year out of HAWP's ten current partnerships for 2001 to 2016.

Figure 6-11: Number of Activities by Partnership (2016)



Source: Author, Program-wide structured questionnaire.

Cost per activity, under this sort of analysis would make the KWA most expensive to the State. EMWP (East Molokaʻi) would be the most cost-effective (see Table 6-6). Measuring efficiency this way, however, is not truly capturing the value of State investment, as it assumes each activity to be of equal utility to the economy or the well-being of the ecosystem. Simply tracking whether a WP conducts more activities does not capture whether this could be considered the best and most efficient (or effective) use of public funds.

Table 6-6: Efficiency Based on Average Funding per Year for Number of Activities Conducted

	Average Funding per year (2016 $ thousands per year)	Number of Activities	Cost (2016 $s) per Activity
East Maui Watershed Partnership (1991)	$220,487.82	8	$27,560.98
West Maui Mountains Watershed Partnership (1998)	$174,681.13	10	$17,468.11
East Molokaʻi Watershed Partnership (1999)	$75,138.31	10	$7,513.83
Koʻolau Mountains Watershed Partnership (1999)	$167,565.00	7	$23,937.86
Kauaʻi Watershed Alliance (2003)	$193,085.61	4	$48,271.40
Kohala Watershed Partnership (2003)	$124,396.69	12	$10,366.39
Leeward Haleakalā Watershed Restoration Partnership (2003)	$192,864.23	10	$19,286.42
Three Mountain Alliance (2007)	$262,084.64	9	$29,120.52
Mauna Kea Watershed Alliance (2010)	$93,124.63	7	$13,303.52

Source: Annual DLNR/DOFAW Legislative Reports; Program-wide structured questionnaire. Analysis by Author.
Note: Data for Waiʻanae Mountains Watershed Partnership not available.

6.3.3 Partnership Staff

- *Have individual partnerships grown?*

It is not possible to know at this time to know how/if individual partnership staff has increased over time. We do have staff counts for 2016, but no data on staff increase over time. However, this could be a good way to capture growth of the partnerships.

6.3.4 Matching Funds

- *Is State funding increasingly being leveraged?*
- *Have the Partners' cost-shares increased over time?*

The analysis presented earlier was based on a detailed and meticulous review of DLNR/DOFAW Annual Reports to the Legislature for years 2000-2016. Unfortunately, funding appropriations for WPs over time have not been reported in a consistent manner over time. At times during the 2000-2016 timeframe, it was reported as part of other funded efforts (NARs for example), and at other times as "Watershed Partnership projects." Some information about matching finds acquired by each of the individual partnerships is available, but only for certain years, making a truly thorough analysis of matching funds over time very difficult at this point. However, the State WPP should seriously consider capturing this data each year in order to estimate the overall efficiency of its Program.

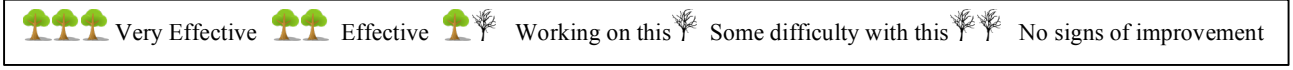
6.3.5 Summary Assessment: Efficiency

Under an efficiency rationale, it can be very challenging to present a clear assessment of the Program's efficiency or effectiveness. There are currently too few reliable data points available to complete a thorough assessment, and WP data currently available have not been consistently gathered/tabulated, so results may not be invalid. For example, since 2001, the DLNR/DOFAW Annual Reports to the Legislature have at times reported Natural Area Reserve Fund Watershed Projects expenditures in some years, while other years separate those from project grants; some years reporting capital improvement projects, and others

with no data are available at the WP level at all. Consistency in reporting such that an assessment of how much, for what, and to whom public funds have been disbursed over time would be a valuable tool for the State to develop in order to track the success of its investment. Table 6-7 demonstrates the particular difficulties associated with evaluating the State's investment from an efficiency perspective.

Table 6-7: Effective Watershed Management from an Efficiency Perspective

INDICATOR	SUMMARY ASSESSMENT
Growth of Partner Investments 	At this time, there is no system in place to collect data about the real ($) or in-kind contribution of all partners in the Program. Having time-series data showing how much each partner has contributed would be an effective way to assess the extent to which partners have pooled resources. This data could be shared with the State WPP, however, a great number of partners are from the private sector, this quest for greater transparency would have to be voluntary (and hence may not accurately reflect data).
State Funding 	Under an efficient model, State funding would not increase over time, as the investment would have utilized to leverage funding from other sources. Under this model, the State has not operated efficiently, as the State has increased its investment, with an average of about $1.4 million per year from 2001-2016, with an 86% increase in funding in 2016 over 2001. However, funding has remained relatively stable from 2013-2016. DLNR/DOFAW Annual Reports to the Legislature should also track funding more diligently and consistently report public investment to this Program (also sharing funding totals by partnership).
Efficiency of Funds in Regard to Number of Activities Conducted 	This research has found that measuring the effectiveness of funding based on possibly funding more activities is not valid. Due to the different needs and the scope of all partnership activities, partnerships who conduct more activities are not necessarily operating more efficiently. This indicator is not recommended for future assessments.
Increasing Staff 	Data on number of staff employed by each WP is only available for year 2016 at this time. In future years, data showing increasing staff would be easily collected and would be helpful in assessing the growth of the partnerships.
Non-state Funding Match 	No consistent data about match investment over time has been collected. The DLNR/DOFAW Annual Reports to the legislature should report not only total funding to each partnership per year, but also the total matched funding each has received by non-DLNR/DOFAW sources.



Source: Author.

Table 6-7 is thus partly a guide to an "ideal" evaluation approach under the Efficiency rationale, but also partly an accounting of the difficulty in obtaining valid data under such an "ideal" approach. However, this exercise has also raised some implicit questions about the validity of the Efficiency approach, at least the notion that assumes a successful program will receive steady or declining government support as it generates evidence of "success." In practice, evidence of success is often used to bolster requests for continued or increased funding, and political decisions about funding over time are often based more on

overall revenue availability, competing demands, and overall policy choices about how to reconcile those demands.

6.4 Ecological Integrity

There is limited quantitative information linking impact of partnership activities on the areas they manage. Moreover, equating upstream land cover changes to groundwater recharge demands additional research. As discussed earlier, improvements over time in terms of ecological change are difficult to capture because of 1) problems establishing causal attribution, or linking apparent improvements on the ground to specific Program activities; 2) lack of resources to gather all data that measure environmental outcomes; 3) long time horizons between implementation of collaborative outputs and measurable environmental change; and 4) limits to accuracy in measuring and analyzing effects of multiple interacting variables that shape environmental change. A mix of indicators, including outputs, theorized as leading to better environmental outcomes might be worth combining when assessing the progress of a Program and the extent to which their activities have led (or are leading to) ecological improvements on the ground:

> The ultimate measure of success is a partnership's effects on physical, biological, or social aspects of watershed-related problems. Measuring implementation alone is not sufficient because well-executed projects can fail to have the desired consequences due to poor design or unforeseeable events (Mazmanian and Sabatier, 1989). In aquatic ecosystems, for example, it is often difficult to identify the root causes of the problem, and acts of nature such as fires, floods, or drought often undo restoration projects (Kondolf and Micheli, 1995). Unfortunately, few partnerships conduct the long-term pre-project and post-project monitoring required to separate the partnership's effects from the effects of other forces within or outside the watershed, or from natural fluctuations. Given the lack of available objective data on effects, this study relies upon a proxy measure— the respondents' perceptions of their partnership's actual effects. (Leach et al., 2002, p. 652)

For these reasons, the assessment of the Program through the rationale of Ecological Integrity focuses on three different types of data:

- Data that are scientific in nature, yet could be operationalized to assess the outcomes of the WPs activities on ecological resources over time with some moderate investment (funding). These include indicators for: watershed health, as increasing overall health over time (Section 6.4.1); prioritizing most at-risk and/or healthiest watersheds (Section 6.4.2); as well as visually tracking on-the-ground changes utilizing before and after aerial photographs or other visual tools (Section 6.4.3).
- Data that are currently collected by DLNR/DOFAW but focus on outputs that essentially are hoped to lead to greater outcomes over time (such as miles of fences built), that are not immediately demonstrative of long term outcomes, but part of the process to get there. These include: acres searched and controlled for invasive plants (Section6.4.4.1); increasing acres protected from hooved animals (Section 6.4.4.2); miles of new fences constructed (Section 6.4.4.3); and miles of fences maintained (Section 6.4.4.4).
- Perception of impact data that have been obtained via survey. These include: perceptions of progress of activities (Section 6.4.5.1); and perceptions of the impact of partnership activities on overall health of watersheds managed (Section 6.4.5.2).

This assessment of the extent to which Hawai‘i’s WPs are actually improving water recharge is only indirectly approached here. There is an implicit connection between the restoration of native ecosystems (by the removal of alien species and the restoration of native ecosystems through the management of feral animals within the systems) that has been embraced as a goal by the HAWP. Ultimately, the activities of HAWP are intended to lead to greater water re-charge, but water-recharge rates are not part of this assessment. The assessment ends with a summary assessment of the extent to which Hawai‘i’s watersheds are effectively managed from an ecological integrity rationale. The evaluative questions outlined in Chapter 4: for the ecological integrity rationale evaluative framework (Section 4.5.4) are as follows:

- Are partnership activities focusing on the most pristine and most at-risk watersheds when selecting areas within which to conduct their activities?
- Are activities conducted leading to noticeable on-the-ground improvements?

- Are WP's successfully managing invasive plants within the areas they oversee?
- Are WP's successfully managing the number of hooved animals within the areas they manage?
- What types of activities do individual WPs conduct?
- Of the activities the WPs performed, which ones do they believe are making the greatest progress?
- Of the activities WPs perform, what is the overall perception of their impacts?
- How many acres of new fences are being constructed over time?
- How many miles of existing fences are individual WPs maintaining?
- What are the issues most often raised by non-partner community members in the areas WPs manage?
- What is the WPs perception of their overall impact on addressing these issues?

6.4.1 Watershed Health Index: Improved Health Over Time

Measuring the impact of Program activities over time could be assessed in the future by looking at increase in overall watershed health over time. An index of watershed health across all watersheds in the State of Hawai‘i was developed by University of Hawai‘i researchers in 2006 (Kido, 2006). The Watershed Health Index (WHI) assessed all (571) watersheds across the main eight high islands in the State of Hawai‘i. The study used a "GIS-based analysis (ArcGIS 9.2) to create a number of basic land cover classes from existing datasets, extract percent cover for each class within a watershed, then weight percent cover data to calculate an ''index of watershed health''(Rodgers, Kido, Jokiel, Edmonds, & Brown, 2012, p.23). This data could be a good baseline upon which to assess the changing nature of the health of Hawai‘i's watershed in the future if the assessment could be repeated every 5 or 10 years.

6.4.2 Watershed Health Index: Prioritizing

Hawai‘i's WPs span across multiple watersheds across the islands in which they operate. An assessment of how the watersheds adjacent to the locations where management activities are being conducted are changing over the years might tell us something about their impact on the ground. Unfortunately, assigning causality of watershed health improvements exclusively to the WPs might not be accurate. For example, watershed health improvement in some areas might be occurring because of other types of investments, or

management groups, or even landownership patterns (development occurring in a coastal area creating changes in land cover) would not necessarily be due to the inadequate work conducted by that local WP.

The data from the 2006 WHI could, however, be helpful in identifying priority areas for management activities. For example, Table 6-8 shows how O'ahu's watersheds are in dire need of more protection than the other islands and/or investments in protecting pristine watersheds may be most effective on the islands of Moloka'i and Kaua'i, which are the islands with the greatest percentage of lands in healthy conditions.

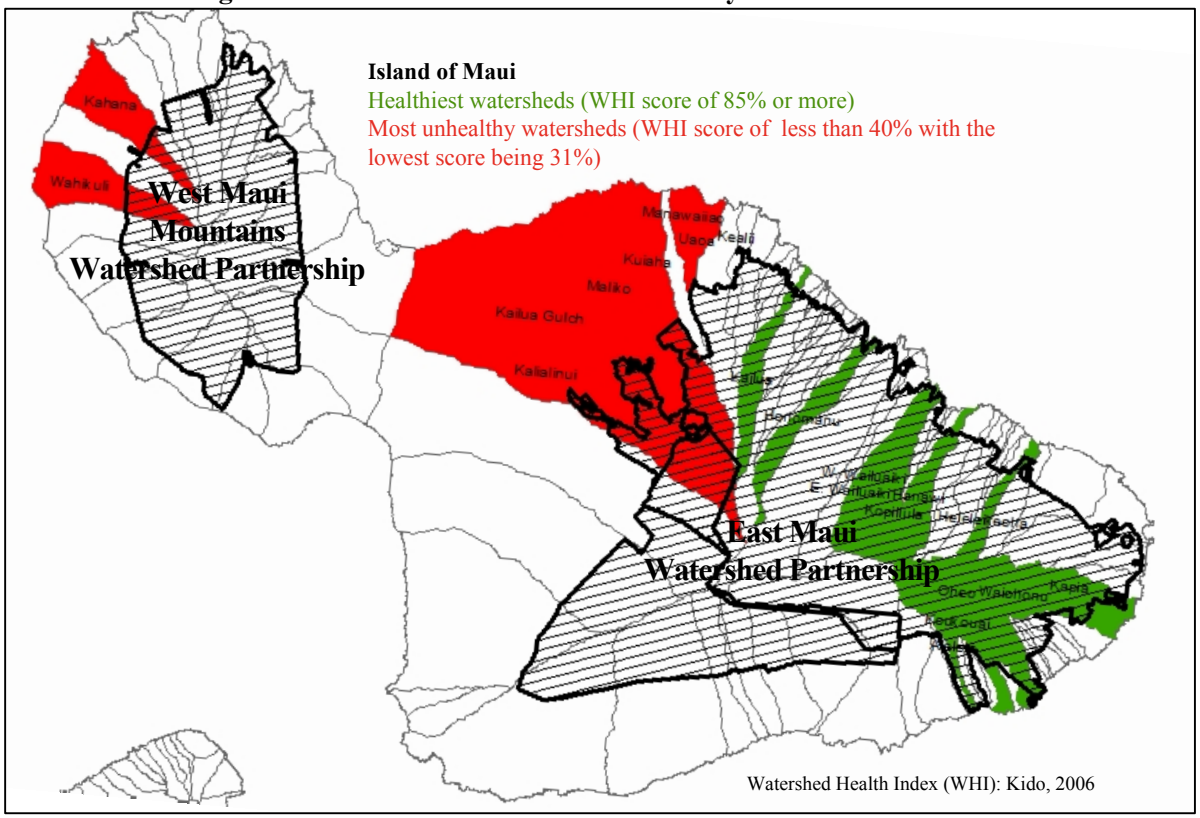
Table 6-8: Watershed Health by Island (2006)

	O'ahu	Maui	Hawai'i	Kaua'i	Moloka'i	Total
Total Number of Watersheds	106	112	159	74	50	**501**
Very Healthy (Index 90% or more)	0	7	13	11	8	**39**
Percent of Island's Watersheds Very Healthy	***0%***	*6%*	*8%*	***15%***	***16%***	***8%***
Percent of Total Very Healthy	***0%***	*1%*	***3%***	*2%*	*2%*	***8%***
Very Unhealthy (Index less than 30%)	20	0	3	5	0	**28**
Percent of Island's Watersheds Very Unhealthy	***19%***	*0%*	*2%*	*7%*	*0%*	***6%***
Percent of Total Very Unhealthy	***4%***	*0%*	*1%*	*1%*	*0%*	***6%***

Source: Kido 2006. Analysis by Author.

In establishing management priorities, or in directing State funding for watershed projects, it could be argued, for example that since there are no pristine (healthiest) watersheds adjacent to its management area, the WMMWP should focus its efforts on remediation (for example weed eradication) and less on re-planting and re-building a native forest. The EMWP manages an area that has some of the most pristine native forest and healthiest watershed on the island of Maui and funding directed at management activities there might hence have a widely different focus (see Figure 6-12).

Figure 6-12: Healthiest and most Unhealthy Watersheds on Maui



Source: Author, with GIS data from DBEDT (Watershed Partnerships Shapefile), 2018; and Kido (WHI), 2006.

As discussed earlier, this assessment could only be properly conducted over time if and when the 2006 Kido assessment was conducted again, and preferably more often in the future in order to allow for an assessment of trend over time. This indicator is essentially a proposition for what could be an "ideal" indicator, despite its own limitations (especially with regard to causality).

6.4.3 On-the-Ground Impacts

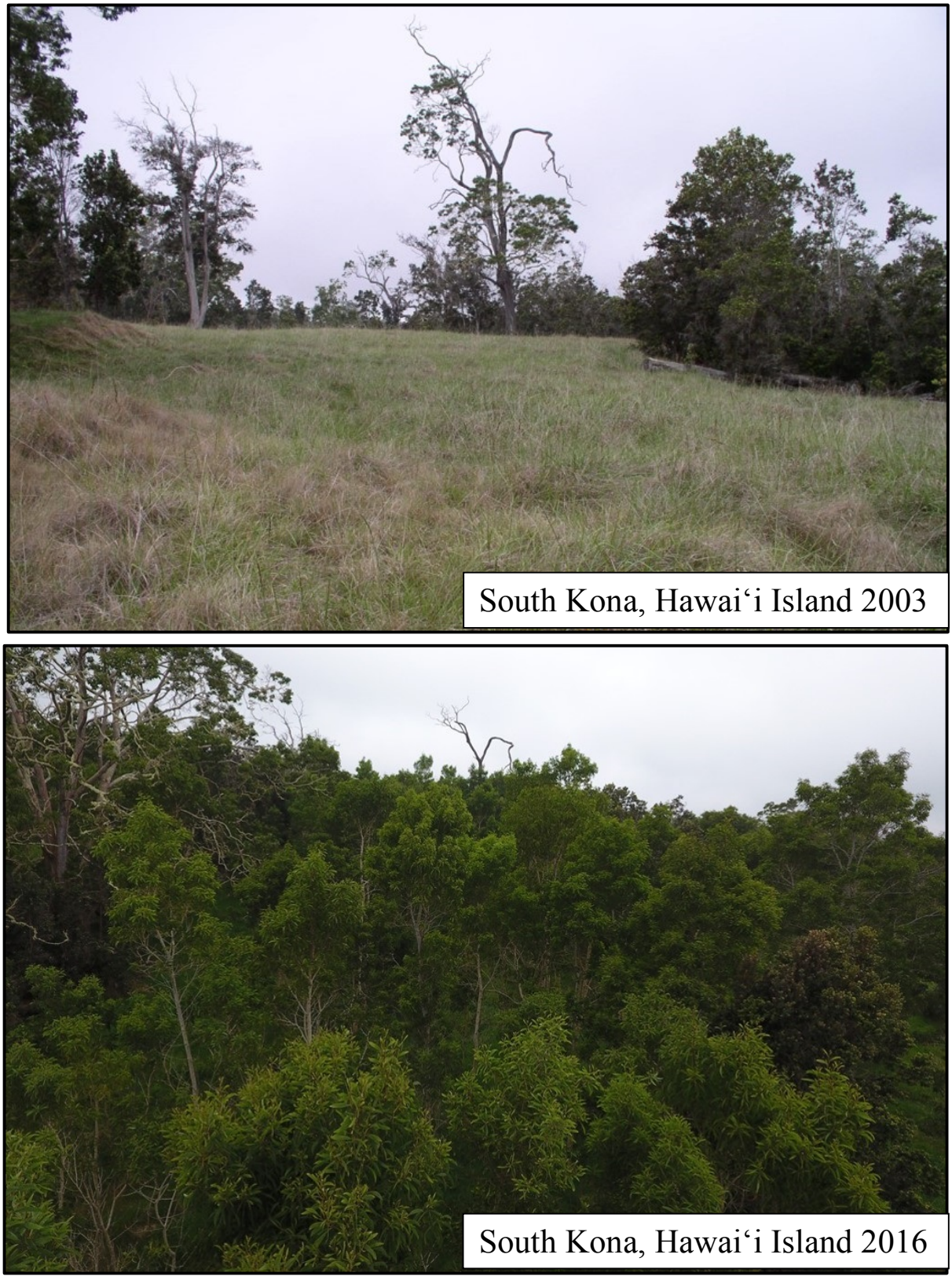
Another indicator that could be utilized over time is imagery of watershed areas prior and after activities have taken place. The following images (Figure 6-13, Figure 6-14 and Figure 6-15, courtesy of The Nature Conservancy) show changes in land cover for areas where fencing was constructed to keep feral ungulates (such as pigs or goats) from accessing certain areas where the native ecosystem was being impacted, in order to allow for re-growth of the native forest. Figure 6-13 is of a landscape in South Kona, on the Island

of Hawai‘i where the placement of a fence to keep pigs out allowed for forest growth to entirely recover over the span of 13 years. Figure 6-14 depicts similar results in the wet forest of East Maui. Both of these are photos, taken on the ground. Images from Figure 6-15 are aerial photographs by Google Earth.

Periodic tracking of improvements in this way can be very effective means of measuring progress. However, imagery results are difficult to quantify. A system of attributing weights or points to changes over time could be an effective way to track progress such as changes in land cover, or percentage of native ecosystems restored over time. At this time, such imagery is sporadic. TNC as well as other environmental organizations have been collecting images for certain areas across the State; however, there is yet no single agency or organization tracking these changes for the entire Program (HAWP), or the state, across all islands. Such an undertaking would likely be too costly for one agency alone to undertake alone, but this type of data would allow for more accurate, and effective ways to measure impact of environmental activities for many Programs conducting conservation efforts.

It should be noted that significant research is already attempting to measure the impact of forest re-growth or other conservation activities on the ground pertaining to water re-charge. For example, the U.S. Geological Survey (USGS) collects data on groundwater levels (water levels in wells), water levels in streams and lakes, and water quality data at various sites throughout the State. The USGS also has studied Hawai‘i’s volcanic aquifers ((Izuka et al., 2018), looking at rainfall patterns for two time periods (1916-2007 and 2001 to 2010), that attempted to revise water recharge rates for the Islands of Oahu, Maui, Hawai‘i, and Kaua‘i. Some research has also focused on comparing the impacts of non-native forests and native forests on water use in some specific areas across the Hawaiian Islands but it remains difficult to say with certainty how much water recharge might be gained by promoting the protection of native forest. More studies will continue to be needed to research species-specific impact on local hydrological systems. Because this research focuses on how to best approach the assessment of WP-specific activities on ecological resources managed, long term studies such as these would be useful.

Figure 6-13: Pre-Post Imagery, South Kona, Hawai‘i

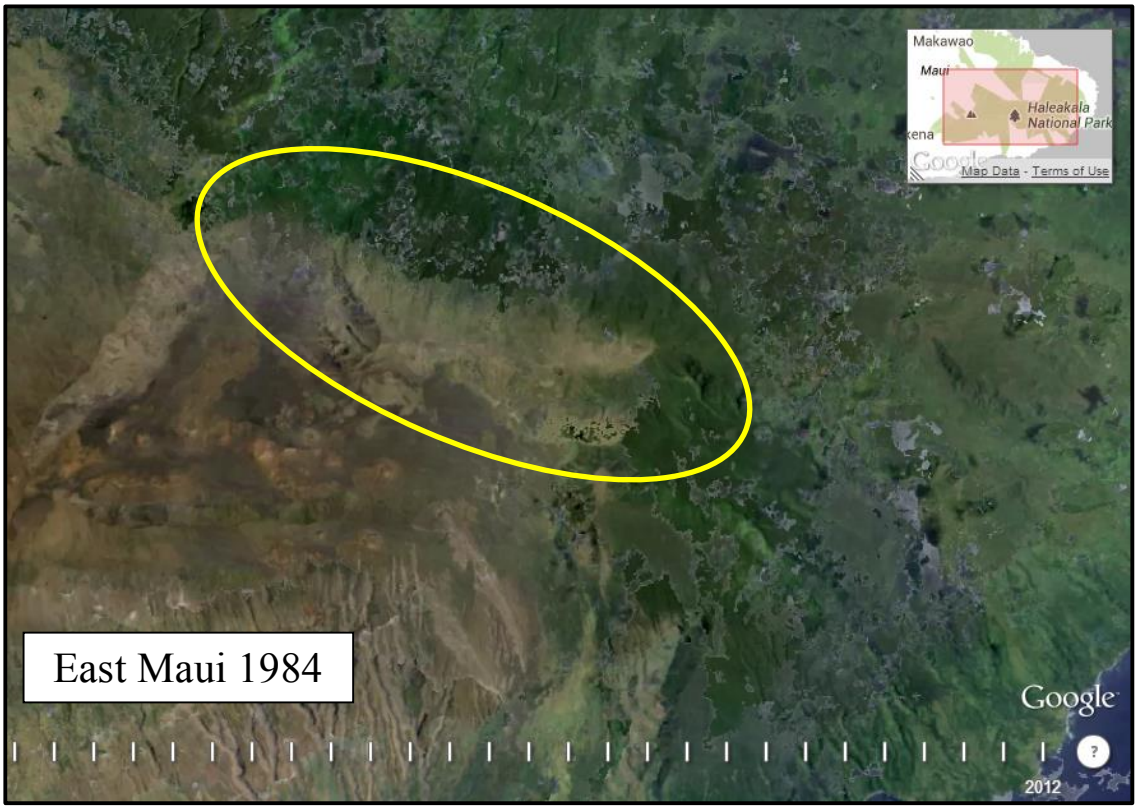


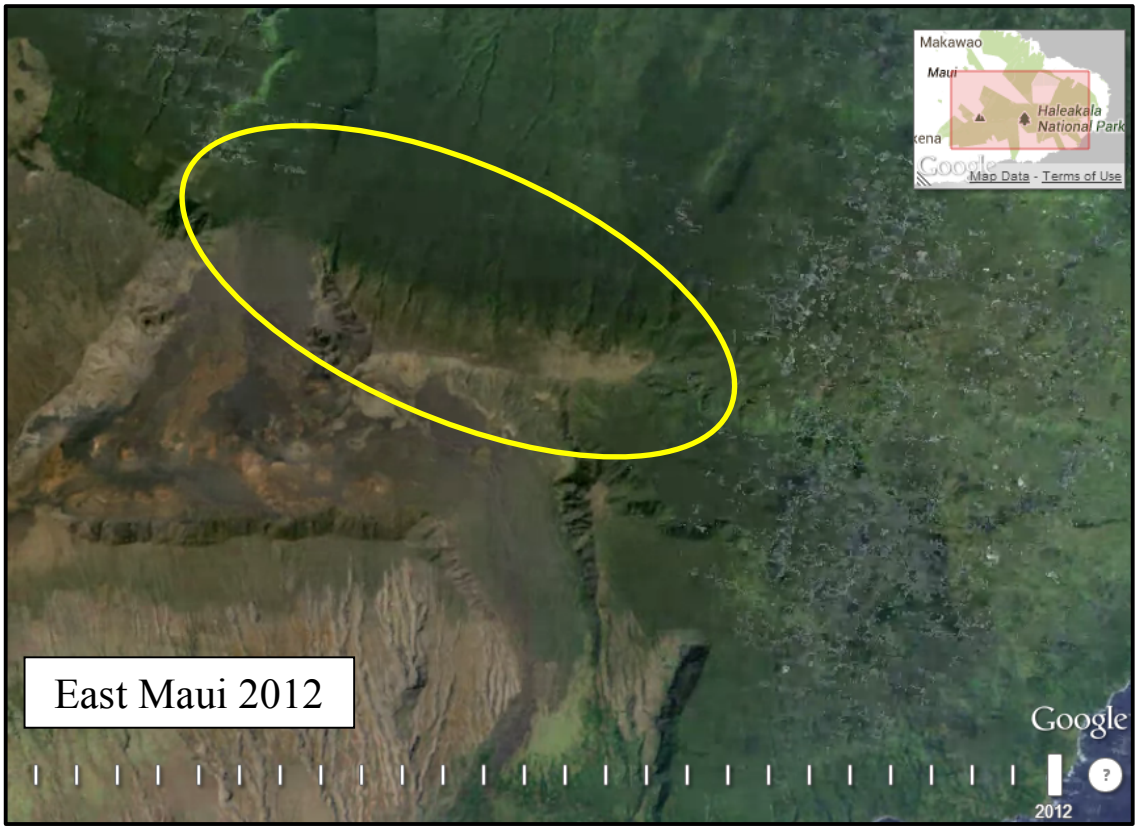
Source: Photos courtesy of The Nature Conservancy, 2017.

Figure 6-14: Pre-Post Imagery, East Maui

Source: Photos courtesy of The Nature Conservancy, 2017.

Figure 6-15: Pre-Post Land Cover Imagery, East Maui





Source: Photos courtesy of The Nature Conservancy, 2017.

6.4.4 Output Data Currently Collected by DOFAW

The DLNR/DOFAW has recently (2014) begun to collect a selection of data in order to evaluate the success of its WPP. As mentioned, these data sets are output data theorized to lead to longer-term outcomes. The data sets are all relatively time-limited (only three years of data), and this makes their assessment limited. However, over time, should the WPP continue to collect this same data (with identical collection methods), significant stories of what is actually happening on the ground could emerge.

It should be noted that the methods for collecting this data are not clear at this point (the Annual Legislative Reports do not mention how these data are collected or reported for each of the partnerships). The effort to start to capture data over time made by the WPP is important, however, and will hopefully continue.

6.4.4.1 Successfully Managing Invasive Plants

- *Are WP's successfully managing invasive plants within the areas they manage?*

Since 2014, the DLNR/DOFAW's WPP has been collecting data on the number of acres searched and controlled per partnership per year to monitor progress towards addressing management of plants that are invasive and problematic to invigorating the native ecosystems of Hawai‘i's watersheds. These data are publicly available through DLNR/DOFAW Annual Legislative Reports and hence presented at the partnership level. It is difficult to identify trends with such a limited time-series of data. The data over a longer period might allow for inferences to be made about improvements over time, or even individual partnership milestones over time, but the data tell us little at the moment. The data seem to currently suggest data-reporting conflicts/misunderstanding or a lack of standardized mechanisms for reporting (as one of the partnerships is clearly reporting a much higher level of effect than the others, as per Table 6-9). Overall, since 2014, the management of invasive plant species through search and control in Hawai‘i's watersheds has nonetheless increased overall.

Table 6-9: Invasive Plants Search & Control (acres)

Partnership	2014	2015	2016
Leeward Haleakalā (LHWRP)	2,449	16,671	10,841
East Molokaʻi (EMoWP)	563	1,545	382
Kauaʻi Watershed Alliance (KWA)	2,691	2,149	418
Kohala (KWP)	N/A	1,545	496
Koʻolau Mountains (KMWP)	483	220	2,623
Mauna Kea Alliance (MKWP)	2,830	84	329
West Maui Mountains (WMMWP)	344	18	298
East Maui (EMWP)	3	41	114
Waiʻanae Mountains (WMWP)	24	10	23
Three Mountain Alliance (TMA)	369	822	412
Total	**9,756**	**23,105**	**15,936**

Source: Compiled by Author from DLNR/DOFAW Annual Legislative Reports.
Note: N/A is data not available.

6.4.4.2 Successfully Managing Hooved Animals

- *Are WP's successfully managing the number of hooved animals within the areas they manage?*

Data that might be helpful to measure the degree to which the number of pigs, goats, cows, deer (any hooved animal) are being removed from protected areas are also available in the DLNR/DOFAW Annual Reports to the Legislature. Individual partnerships have reported improvements in successfully managing acres protected from hooved animals (in most instances pigs, goats, and cows) from 2014 to 2016 (see Table 6-10). Due to the limited time series data available and because the methods for reporting such activity is unclear, the progress of the WPs in successfully managing hooved animals in the management areas in which they conduct their activities is problematic at this time.

Table 6-10: Protected from Hooved Animals (acres)

	2014	2015	2016
East Molokaʻi (EMoWP)	10,730	3,280	7,736
West Maui Mountains (WMMWP)	4,547	7,495	5,618
Leeward Haleakalā (LHWRP)	4,511	2,873	5,145
East Maui (EMWP)	6,003	8,939	6,003
Kauaʻi Watershed Alliance (KWA)	5,579	5,725	6,928
Three Mountain Alliance (TMA)	1,507	31,116	31,116
Kohala (KWP)	N/A	971	1,511
Mauna Kea Alliance (MKWA)	515	7,067	525
Koʻolau Mountains (KMWP)	376	N/A	712
Waiʻanae Mountains (WMWP)	N/A	N/A	N/A
Total	**33,768**	**67,466**	**65,294**

Source: Compiled by Author from DLNR/DOFAW Annual Legislative Reports.
Note: N/A is data not available.

6.4.4.3 Increasing Fence Miles

- *How many acres of new fences are being constructed over time?*

Miles of newly constructed fence is an alternative metric, tracked since 2014. New fences demonstrate one type of progress. However, without any historical benchmarks to represent the starting point or an ultimate Program-wide goal to be met, measuring progress of this endeavor is far from compelling. DLNR/DOFAW should consider compiling data on overall intended miles to be constructed, and measure progress each year as movement towards that ultimate goal.

Table 6-11: Fences: New Construction (miles)

	2014	2015	2016
Three Mountain Alliance (TMA)	6.0	2.0	N/A
Leeward Haleakalā (LHWRP)	6.0	N/A	2.0
Kauaʻi Watershed Alliance (KWA)	N/A	N/A	2.6
West Maui Mountains (WMMWP)	N/A	0.5	1.2
Koʻolau Mountains (KMWP)	1.0	N/A	N/A
East Maui (EMWP)	1.0	N/A	N/A
Mauna Kea Alliance (MKWA)	N/A	N/A	1.0
East Molokaʻi (EMoWP)	N/A	0.1	N/A
Kohala (KWP)	N/A	N/A	N/A
Waiʻanae Mountains (WMWP)	N/A	N/A	N/A
Total	**14.0**	**2.6**	**6.8**

Note: N/A is data not available.
Source: Compiled by Author from DLNR/DOFAW Annual Legislative Reports.

6.4.4.4 Miles of Fences Maintained

- *How many miles of existing fences are individual WPs maintaining?*

Checking on fences is largely conducted by Partnership staff, and has to be continuously done because Hawai'i's tropical environment encourages swift forest growth that quickly engulfs fences. Fences are also vandalized from time to time. Any damage to fences, or situations where the forest may have overgrown the fence, provide opportunities for animals to re-enter the protected fenced-in units, voraciously reproducing and adding significant strains on Partnership staff. Over time, these data tell us little about impact on local conditions, but in the future, may offer insight about staffing needs by partnership, as increases in miles monitored potentially signal greater need.

Table 6-12: Existing Fences: Maintenance (miles)

	2014	2015	2016
Mauna Kea Alliance (MKWA)	14.0	51.0	7.0
Three Mountain Alliance (TMA)	31.0	4.0	36.0
Leeward Haleakalā (LHWRP)	20.0	21.0	20.0
Kohala (KWP)	10.0	9.0	16.0
East Molokaʻi (EMoWP)	6.0	10.0	14.2
Kauaʻi Watershed Alliance (KWA)	6.0	6.0	9.4
West Maui Mountains (WMMWP)	6.0	8.0	8.0
East Maui (EMWP)	7.0	8.0	7.0
Koʻolau Mountains (KMWP)	N/A	N/A	7.0
Waiʻanae Mountains (WMWP)	N/A	N/A	N/A
Total	**100.0**	**117.0**	**124.6**

Note: N/A is data not available.
Source: Compiled by Author from DLNR/DOFAW Annual Legislative Reports.

6.4.5 Perceptions of Impact of Activities on Watershed Health

This final section for the ecological integrity rationale focuses on participant (in this case WP Coordinators) perceptions of impact of activities to ecological improvement on the ground. This method for analyzing environmental outcomes has widely been used in the environmental evaluation field as an alternative to measuring actual on-the-ground progress correlating to the various reasons discussed earlier in this section as well as throughout this research. Participant perceptions can often be skewed (because participants may want or even believe their activities to have more meaningful impact than might be borne out by reliable data), and on their own, might not be valid means of assessing success, but as part of a greater framework, may provide a good snapshot of outcomes on the ground.

6.4.5.1 Perceptions of Progress on Activities

- *What types of activities do individual WPs conduct?*
    - *Of the activities the WPs perform, which ones do they believe they are making the greatest progress?*
    - *Of the activities WPs perform, what is the overall perception of their impacts?*

One way to find out about the success of partnership activities on local area resources is to ask the Coordinators their thoughts on the impact of their activities. To do this, the Program-wide structured

questionnaire first asked Program Coordinators about the activities they perform. Activities performed by the partnerships in HAWP include:

- Watershed Resource /Ecosystem Monitoring
- Feral Animal Control (non-ungulate)
- Aquatic Pollutant Management
- Invasive Weed Control
- Public Education and Outreach
- Management Infrastructure/ Coordination
- Fire Control
- Vegetation/Rare species Enhancement/Protection
- Native Species Enhancement
- Human Activities Management
- Fencing

The coordinators were then asked to identify the top two activities with which they believe they have made the most progress over the last five years. Table 6-13 identifies fencing, ungulate control, invasive weed control, public education and outreach, aquatic pollutant management, and management infrastructure/coordination as the top activities with which they have made the most progress.

Table 6-13: Activities Perceived to Have Made Most Progress on in the Last Five Years

Top 1 Activity	Top 2 Activity
Fencing *(1 out of 8 partnerships)*	Fencing *(5 out of 8 partnerships)*
Ungulate Control *(3 out of 8 partnerships)*	Ungulate Control *(1 out of 8 partnerships)*
Invasive Weed Control *(2 out of 8 partnerships)*	Public Education and Outreach *(1 out of 8 partnerships)*
Public Education and Outreach *(1 out of 8 partnerships)*	Aquatic Pollutant Management *(1 out of 8 partnerships)*
Management Infrastructure/Coordination *(1 out of 8 partnerships)*	

Source: Compiled by Author from Program-wide structured questionnaire.

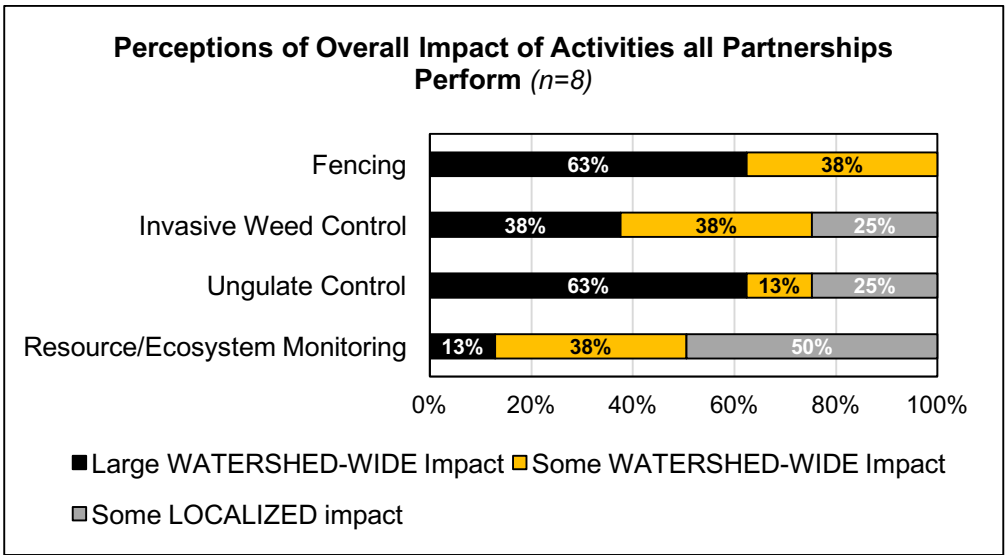
6.4.5.2 Positive Impact of Partnership Activities on Overall Health of Watershed

The coordinators were also asked for their perceptions of the impact of the activities they conduct on the overall watershed health during the last five years. Respondents were asked to assess their activities, and choose the level of impact they thought they made:

- Large WATERSHED-WIDE Impact
- Some WATERSHED-WIDE Impact
- Some LOCALIZED Impact
- No Real Noticeable Impact
- Does not apply

Figure 6-16 shows only the activities that all individual Partnerships conduct: fencing, invasive weed control, ungulate control, and resource/ecosystem monitoring. Fencing and ungulate control have similar goals and both are perceived to have had large watershed level impact in the areas they manage. Ecosystem monitoring has had a more localized impact. A follow-up question about these four main activities, asking about the level of progress made with each of these activities may be valuable in future assessments.

Figure 6-16: Perception of Overall Impact on Overall Watershed Health



Source: Compiled by Author from Program-wide structured questionnaire.

For activities not all partnerships perform, native species enhancement is perceived to have had a much larger (watershed-wide) impact while specific species enhancement/protection (planting) is perceived to have had only some localized impact (see Table 6-14).

Table 6-14: Perceptions of Impact of Activities not Performed by all Partnerships

	Large WATERSHED-WIDE Impact	Some WATERSHED-WIDE Impact	Some LOCALIZED Impact	No Real Noticeable Impact
Native Species Enhancement *(n=7)*	**57%**	29%	14%	0%
Public Education and Outreach *(n=6)*	33%	**50%**	17%	0%
Management Infrastructure *(n=6)*	**50%**	0%	**50%**	0%
Species Enhancement/Protection *(n=6)*	17%	17%	**67%**	0%
Feral Animal Control (non-ungulate) *(n=3)*	0%	33%	33%	33%
Aquatic Pollutant Management *(n=3)*	33%	33%	33%	0%
Fire Control *(n=3)*	0%	100%	0%	0%
Human Activities Management *(n=3)*	33%	33%	33%	0%
Sediment Ponds Management *(n=1)*	0%	0%	100%	0%

Source: Compiled by Author from Program-wide structured questionnaire.

6.4.6 Summary Assessment: Ecological Integrity

When assessing the degree to which Hawai'i's watersheds are effectively managed under an ecological integrity rationale, a number of limitations make the efforts look as though limited (to poor) improvements have been made. This is not to say that this is actually the case, but the limited data available to assess the success of Program activities over time, as well as the validity of the indicators suggested fail to capture a positive outcome in this case. Table 6-15 summarizes the findings and highlights the limitations uncovered.

Table 6-15: Effective Watershed Management from an Ecological Integrity Perspective

INDICATOR	SUMMARY ASSESSMENT
Tracking Watershed Health over time	The Watershed Health Index (WHI) that was published in 2006 by Professor M. Kido could be a useful tool to use to track the improvements of the Health of Hawai'i's watersheds since 2006. However, the study would have to be conducted again, and improved health across the State's watershed might not be due specifically to the activities conducted by the Program (HAWP).
Prioritizing Watersheds	The WHI, if updated could also be utilized to set priorities for the WPs, by identifying most at-risk areas (where remediation work could occur) as well as healthier areas, where native reforestation could be maximized.
Tracking On-the-Ground Improvements	A statewide baseline assessment of our ground cover, utilizing aerial photography could be undertaken and replicated either at 5 or 10 year intervals, to track changes in ground cover and improvement over time. There is already existing pre/post imagery showing compelling progress of conservation activities (such as fencing) in some natural area reserves across the State. Since the effort might be large in scope, Google Earth could be utilized.
Acres Searched and Controlled for Invasive Species	The State WPP is actively collecting data on acres searched and controlled for invasive species for all of the WPs. The data series is short (2014-2016) which makes an assessment of progress difficult at this time. Acreages searched and controlled have nonetheless increased since 2014, but questions regarding data collection and methods make the reported data unreliable at this point in time.
Acres Protected from Hooved Animals	Similarly, the WPP has been collecting data on acreages protected from hooved animals. Due to limited data, data applicability, and questionability as to the consistency in data gathering methods, it is difficult to make an assessment at this time.
Increasing Miles of New Fence Constructed and Maintained	The WPP is also collecting data about miles of (new) fences constructed and miles of fences maintained within each WP each year. Without historical benchmarks to represent the starting point or ultimate goal, measuring progress of this endeavor is not very compelling. DLNR/DOFAW should consider compiling data on overall intended miles to be constructed, and measure progress each year as movement towards that ultimate goal.
Perceptions of Overall Impact of Activities on Watershed Health	While perceptions of impact might reflect inflated confidence in activities conducted leading to greater improvements coming from Coordinators of the WPs, who actually manage/oversee these activities, this assessment demonstrates that fencing, ungulate control and invasive weed control are the activities for which the Coordinators have made the most progress in the last five years. This assessment could be used in future years to assess the particular activities that are perceived to lead to greatest progress.

Source: Author.

CHAPTER 7: CONCLUSIONS

ʻAʻohe pau ka ʻike i ka hālau hoʻokahi.
All knowledge is not learned in just one school.
(Pukui, 1983)

This research has sought to evaluate decisions made by CNRM groups, using the case of an organization of ten individual Watershed Partnerships (WPs) across five islands in the State of Hawaiʻi. Essentially, this research has found that no single rationale for assessment provides a complete analysis of the success of collaborative efforts in the case of Hawaiʻi. A collaborative process ideally includes broad representation in order to promote collective goals, and thus, evaluating the success of collaborative efforts should also reflect the potentially differing motivations and values of various stakeholders, while also utilize a variety of approaches to measure those perspectives.

7.1 Analysis of Research Results Revisited

The research conducted for this dissertation involved answering evaluative questions assessing the CNRM group's efforts while looking at its activities and outcomes through the rationales of equity, efficiency, deliberative democracy, and ecological integrity. This research was undertaken in order to demonstrate how a variety of indicators to assess the success of a CNRM group might better capture the impact of their activities on the ground. Overall, the degree to which Hawaiʻi's watersheds are effectively managed under four rationales vary greatly, and dependent upon which rationale is utilized to frame the evaluation.

The findings of this research affirm that Hawaiʻi's watersheds may appear to be managed somewhat effectively under both the equity and democratic rationales. That is, given the indicators utilized in this

research, assessments under the equity and democratic rationales led to more favorable results than those examined under the efficiency or ecological integrity rationales. This implies two alternate findings: 1) indicators identified for both the equity and the democratic rationales might be more easily captured than those incorporated in the efficiency or ecological integrity frameworks; and 2) Hawai‘i’s WPs are simply more successful from an equity or democratic perspective than from an efficiency or ecological integrity perspective. Let us review these two possible conclusions (which are divergent but not necessarily be mutually exclusive):

1) The indicators suggested for the equity and democracy rationales may have indeed been easier to capture than those suggested for the efficiency and ecological integrity rationales. Many of the indicators in fact were chosen based on an extensive review of the literature, and consisted of already tested strategies to assess these themes. The author also focused many of the questions of the structured questionnaire on the concept of “inclusiveness,” trying to see if input received from non-partner community members actually led to changes in either the activities WPs performed or in the management plans they drafted (Pathways to Participation).

2) The results that show Hawai‘i’s WPs successfully operating from an equity and democratic perspective should not, however, be dismissed, despite the fact that Hawai‘i’s WPs are in fact restrictive in regard to membership (which was a key issue at the beginning of this research). Results have shown that the CNRM group not only supports non-partner involvement in the decisions it makes, but also actively seeks the engagement of non-partner community members through educational outreach as well as strategic consultation (for example, while the Environmental Assessment drafted for the Moloka‘i Pakui Watershed Project did not trigger Hawai‘i’s environmental law, consultation was still conducted). Furthermore, the indicators proposed for the efficiency rationale were initially assumed to produce results of impact that would be more complete and valid measures of the Program’s outcomes. It was unfortunate that much of the data necessary to adequately assess this rationale was not available for this research, likewise for the

ecological assessment. The assessment of rationales, however, are not meant to be measured against one another.

The main findings from this evaluation are summarized below (Table 7-1). Scores have been assigned to each rationale. These scores reflect the difficulties associated with trying to utilize one rationale over another to frame the evaluation of the Program as a whole. A comprehensive assessment should hence not separate each rationale from one another (or score them against one another), but rather focus on incorporating a broad range of indicators that span across rationales.

The scores (percentages) arrived at under the individual rationales reflect the number of "good trees" allocated out of a total maximum number of "good trees" possible under each of the rationales. For example, under the rationale of equity, which comprised of seven indicators, a total number of "good trees" allocated would have amounted to 21 (since "Very Effective" consisted on three "good trees"). From this a percentage of 48% was calculated. This assessment is meant to give an overview of the indicators under which this Program demonstrated positive results, however, should not be used to assess the Program across rationales (as unequal numbers of indicators were attempted under each rationale and because some indicators did not fare well due to unavailability of data and not because of poor performance).

Table 7-1: Summary of Findings

RATIONALE	MAIN FINDINGS
Equity: **Overall Score:** **("Good Trees")**  **10 out of a possible 21= 48%**	**Outreach and Education Strategy:** • Only one partnership has a paid position for an outreach coordinator • Funding for outreach activities is difficult to get • Statewide HAWP seeking to hire a coordinator to increase visibility **Landownership Requirements:** • No formal requirement but informally restrictive to landholding partners with resources to commit **Broad Representation by Various Sectors:** • Broad representation across sectors but private-sector representation is skewed to landowning stakeholders **Consultation Strategies:** • Outreach and educational events are successful mechanisms to gather non-partner community feedback **Impact of Consultation Strategies:** • Feedback received from non-partner community members through outreach and educational events, focus groups, as well as through environmental review processes are most likely to impact WP activities and goals. **Involving the Public (Volunteers):**

	• Volunteer hours since 2014 have increased (but limited time-series) • No impact on volunteer data available **Organizational Inclusiveness: Pathways to Participation** • Hawai‘i’s WPs have a high-level of commitment to participation • Most also provide opportunities for non-partner community members to provide feedback, but none actually have formal obligations or policies that mandate they do this
Deliberative Democracy **Overall Score:** **(“Good Trees”)**  **10 out of a possible 18= 56%**	**Frequency of Partnership Meetings:** • Partner meetings are occurring regularly **Decision-Making Mechanisms:** • Decisions in Hawai‘i’s WPs are largely made by consensus **Partnership Priorities: Management Plan Updates** • While not all partnerships have yet updated their management plans, all of them have drafted at least one **Deliberative Outreach:** • Most feedback received from non-partner community members occurs via educational events and formalized agreements (MOUs, MOAs) • Public hearings and public opinion surveys have not been successful means of gathering input **Involving the Public:** • Only volunteer hours per year (2014-2016) available • Targets on broadened audiences reached not available (who is coming) **Regulatory Changes:** • Recent regulatory change in regard to exempting fencing for DLNR activities that trigger EA actually reducing non-partner community member opportunities for feedback
Efficiency **Overall Score:** **(“Good Trees”)**  **1 out of a possible 15= 7%**	**Partner Investment:** • Data on personal investment by all partners (including financial, man-power, or in-kind resources) not available. **State Investment:** • State’s overall funding has fluctuated over time and recently diminished • Investments made to date should lead to higher levels of cost-sharing and leveraging of these funds **Activities Performed:** • WPs conducting more activities does not appropriately capture best and most-efficient use of public funds. **Increasing Staff:** • This could be a good way to capture growth of partnership **Matching Funds:** • Analysis of matching funds over time not feasible at this point. Should be pursued
Ecological Integrity **Overall Score:** **(“Good Trees”)**  **2 out of a possible 21= 10%**	**DLNR/DOFAW Collected: Invasive Plants Search and Control** • Difficult to identify trends with such a limited time-series of data (2014-2016) • Reporting conflicts/misunderstanding or a lack of standardized mechanisms for reporting (as one of the partnerships is clearly reporting a much higher level of effect than the others) **DLNR/DOFAW Collected: Hooved Animal Control** • Acres protected from hooved animal two-year improvements have been noticeable • Program-wide goals of miles of fences completed only compelling with milestones established upon which to measure progress • Miles of fences checked and maintained may over time give insight about staffing needs by partnerships, as increasing miles monitored might be signaling of greater need **Perceptions survey: Activities Conducted** • Fencing; ungulate control; invasive weed control; public education and outreach; aquatic pollutant management; and management infrastructure/coordination are the top activities WP coordinators feel they made the most progress **Perceptions survey: Overall Impact on Watershed Health** • Fencing and ungulate control have similar goals and both are perceived to have had large watershed-level impact in the areas WPs manage. • Ecosystem monitoring has had a more localized impact • Native Species Enhancement has had a much larger (watershed-wide) impact • Species Enhancement/Protection (planting) had only some localized impact

Source: Author.

7.2 Research Propositions and Questions Revisited

This research evolved around a set of five main propositions and research questions. They are revisited here. The first proposition of this research suggested that CNRM groups collaborate for different reasons, and that in order to assess whether or not a collaborative effort is successful, one must first acknowledge and understand the participants/members' reasons for participating. This proposition led to a research question that asked: How do prevailing rationales frame our ability to evaluate "successful" decision-making in collaborative natural resources management efforts? There is no question that underlying motivations drive not only the participants in a CNRM effort but also the funders, and evaluators directly influence how their success is measured.

With each new interview and with each new document assessed for this research, it became increasingly evident that the lens through which each interviewees saw their own success made them question the need to delve into other ways to frame success. For example, for many of the participants in this research, it was surprising to hear about how concepts of democracy and equity might inform an evaluation of the degree to which Hawai'i's WPs are successfully managed. For most of the WPs, staff are trained in the sciences, and generally view the success of their activities as leading to tangible on-the-ground ecological improvements. For the legislators, however, who might fund their Program, suggesting that efficient use of disbursed funds may be a paramount concern.

The second proposition suggested that involving more stakeholders in a decision-making process makes collaborative efforts more fair and promotes more equitable outcomes. To discuss equity, the research asked: How do representation, voting mechanisms, and consultation strategies impact decision-making? This research found that limited representation does seem to allow for decisions to be arrived at more often by consensus. For example, Hawai'i's smaller partnership size results in most partnerships coming to agreement by consensus, as compared to other partnerships in the Continental U.S. that are typically larger

and make decisions by majority vote. This research also found that consultation strategies such as educational events or environmental review are both meaningful strategies to engage non-partners in decision making. This is important because the preparation and process of environmental review is costly, and at times has been perceived as ineffective at assembling meaningful input from members of the community. This research demonstrates that input received under the environmental review process does lead to amendments for projects undertaken by Hawai‘i’s WPs.

To address the concept of justice, the third proposition suggested that local policies mandating public participation in environmental management are central to promoting environmental justice and the principles of democracy. This proposition generated a research question that asked how state environmental policies support or undermine public participation in resource management. As touched upon in the preceding paragraph, environmental review was shown to be a meaningful tool to support community input into decision-making. The State DLNR amended its Agency Exemption List in 2015 to allow the agency to move forward with fencing projects without being obliged to undergo environmental review. This may be a good example of a rule or law amendment undermining public participation, leaving an opportunity for the State agency to make the call on whether or not going through the environmental review process has been a successful approach. Open policies (or policies that offer choices), giving State agencies opportunities to make decisions based on place-based knowledge have worked in Hawai‘i’s case.

The fourth proposition presumed that in resources management cross-sector collaborations lead to more efficient outcomes than do efforts conducted by sole-sector efforts, especially more than by solely State-driven efforts. Related research questions included: How does funding impact decision-making? How is public funding allocated, and to whom? Because of the limited data available for this research, it has been difficult to draw conclusions regarding the impact of funding on decision-making. This research has shown that – despite WPs’ exhibiting a strong commitment to education and outreach to promote not only the visibility of the Program but also, to instill conservation values for stakeholders in communities near or in

the management areas where the WPs are conducting their activities – limited funding has been available to support full-time positions in most of the partnerships. Further research into the Program's allocation of funding should be pursued.

Finally, the fifth proposition assumed that working to manage resources collaboratively leads to better environmental outcomes than when just one group attempts to do this. The main research questions under this proposition included: Are activities conducted leading to tangible, measurable, on-the-ground improvements in Hawai'i? Do they lead to better managed upper watersheds and ultimately improve natural ecosystems and/or water re-charge? As with the limited funding data available, limited data on environmental outcomes also impedes our ability to conclusively answer these questions. At this time, the best (and most convincing) indicator showing the impact of activities of the WPs are the "before" and "after" imagery discussed in Section 6.4.3 of this research. While it might prove time consuming and potentially costly to conduct this type of assessment across the many acres that comprise the WP management areas, the visual impact of these pictures certainly could be a compelling tool to encourage potential funders to continue to support conservation activities such as those conducted by the WPs, as their work seems to lead to positive, concrete, noticeable impacts on the ground.

7.3 Implications for Hawai'i's State Watershed Partnership Program

In its efforts to track the growth of its collaborative CNRM efforts, DLNR/DOFAW should continue to accumulate suitable indicators of Program outputs and outcomes. While the current WPP has already begun to collect data to this end, this research has suggested that some measures might not be particularly effective (for example, "acres searched and controlled for invasive species" tells us little about actual on-the-ground improvements). Other measures are suggested in this research – for example, adding a volunteer experience metric as well as data on characteristics of the volunteers, to get a sense of the types of audiences reached. This research also suggests it would be useful to gather data on partner investments, as well as

systematically tracking funding (including matching funds). Finally, tracking staff counts for all partnerships could be a good way to anticipate future individual partnership needs.

Table 7-2 lists all of the indicators discussed in this research by rationale, identifies those the State WPP is already tracking; and notes those specifically assessed (attempted) for this research. The table also identifies indicators that should be considered in future assessments (including some that were not possible for the author at the time of this research).

Table 7-2: Suggested Indicators for Future Assessments

Rationale Cross-Cutting Themes	Suggested Indicator(s)	Data now collected by State WPP *	Indicator analyzed in this research	Propose to use in future assessments
Equity Empowerment Inclusiveness Representation Transmission Transparency	An Outreach and Education strategy has been developed	-	✔	✔
	An Outreach and Education Coordinator has been employed	-	✔	✔
	Increasing number of volunteer hours over time	✔	✔	✔
	Increasing impact on volunteers	-	-	✔
	Increasing community engagement (pre/post surveys of volunteer experience)	-	-	✔
	Landownership requirements are not a factor in membership	-	✔	✔
	Representation is cross-sectoral and involves non-landowning stakeholders	-	✔	✔
	Consultation strategies are being tracked	-	✔	✔
	Feedback received leads to changes/modifications in Program Plans or activities	-	✔	✔
	Program has openings, opportunities as well as obligations as it relates to participation	-	✔	✔
Democracy Fairness Knowledge Legitimacy Lawfulness Transparency Transmission	Partnership meetings are held and well attended	-	✔	✔
	Partnership decisions are made by consensus	-	✔	✔
	Management plans are updated regularly	-	✔	✔
	Formal deliberative processes are instigated and process of consultation is fair	-	✔	✔
	Local laws reflect changes that reflect community concerns	-	✔	✔
Efficiency Accountability Adaptability Transparency	Partner investment has grown over time	-	-	✔
	State funding has not increased significantly over time	-	✔	✔
	Individual partnership staff has increased over time	-	✔	✔

	Non-state funding match has increased over time	-	-	✔
	Partnerships with the greatest share of State funding have been able to conduct more activities	-	✔	-
Ecological Integrity Monitoring Environmental Quality Land Cover Biological Diversity Environmental Parameters	Increasing number of acres searched and controlled for invasive species	✔	✔	✔
	Increasing acreage protected from hooved animals	✔	✔	✔
	Increasing miles of new fence constructed and maintained	✔	✔	✔
	Coordinator perceptions of overall impact of partnership activities on watershed area	-	✔	✔
	Management activities are taking place in the healthiest and most at-risk watersheds	-	✔	✔
	Watershed health shows signs of improvement over 2006 baseline (WHI)	-	-	✔
	Native Habitats show signs of re-growth (pre/post fencing/ungulate management imagery)	-	✔	✔

Source: Author. Note: * Whether the data is currently collected by the State WPP for evaluative purposes.

The State WPP as well as the individual partnerships might also benefit from reviewing the assessment of which indicators suggested in this research might be immediately possible without having to undergo significant effort or incur significant cost, versus those that would require additional planning. Table 7-3 separates this research's indicators by: 1) what is currently available or feasible; 2) indicators that were assessed using the results from a survey administered by the Author (which is easily replicable); and 3) indicators that would require some investment (of time or financial contributions) to operationalize.

Table 7-3: Feasibility of Data Collection

EQUITY	Currently Possible	Replicable Author Survey	Would Require New Approach
Development of an Outreach and Education Strategy	✔		
Limited Landownership Requirements for Membership	✔		
Broad Representation by Various Sectors	✔		
Impact of Consultation Strategies		✔	
Involving the Public (Volunteer Hours)	✔		
Involving the Public (Impact on Volunteers)			✔
Organizational Inclusiveness: Pathways to Participation		✔	
DEMOCRACY			
Frequency of Partnership Meetings	✔	✔	
Decision-Making Mechanisms		✔	
Partnership Priorities (Management Plans)	✔		
Deliberative Outreach		✔	
Involving the Public (Volunteer Hours)	✔		

Involving the Public (Impact on Volunteers)			✔
Regulatory Change	✔		
EFFICIENCY			
Partner Investment			✔
State Funding	✔*		✔
Partnership Staff	✔		
Matching Funds			✔
ECOLOGICAL INTEGRITY			
Watershed Health Index Improved Health			✔
Watershed Health Priority Planning			✔
On-the Ground Impacts (Visual/Photo Assessment)	✔		
Acres Searched and Controlled for Invasive Plants	✔		
Acres Protected from Hooved Animals	✔		
Miles of New Fences Constructed	✔		
Miles of Fences Maintained	✔		
Increasing Number of Activities		✔	
Perception of Progress of Activities		✔	
Perception of Impact of Activities on Watershed Health		✔	
Perception of Impact of Activities on Watersheds		✔	

Source: Author. * **Note:** While state funding is currently available in State Legislative Reports, their accuracy may be questionable as the State has not systematically collected the data in a manner that would make it easy to draw comparisons by partnerships over time.

7.4 Implications for Planning and Evaluation

As we continue to emphasize greater representation, inclusiveness and collaborative efforts in planning, more attention needs to be paid to devising additional tools to assess the success of these efforts. The field of Planning has increasingly promoted the importance of addressing power imbalances and seeking more just outcomes by promoting collaborative approaches that allow for more input into decision making. While the emphasis on greater equity plays a large role in assessing the success of collaborative efforts, we should not lose sight of the many other critical factors that are also essential in measuring the success of these efforts. This research has sought to present a more holistic way to assess the success of CNRM efforts by taking a cross-disciplinary approach in more than one academic field, including the fields of public management and the sciences, and focusing on more than one motivation.

Research on evaluating the success of CNRM efforts has brought forth a number of guiding frameworks. In fact, research on good governance offers strategies of what makes CNRM efforts more effective.

However, much less has been presented on devising effective ways to operationalize/measure these principles. This research seeks to bolster the set of tools to operationalize strategies advanced in the literature, as well as contribute a new perspective on indicators that might have been overlooked.

We operate in a world filled with multiple uncertainties, and must remain conscious that learning is a dynamic and constantly evolving process. Goals established at the onset of a research (or evaluation) may change and evolve, thus presenting planners with new ideas and challenges along the way, and possibly requiring course correction which could include the manner in which we collect data to measure success. Evaluation cannot remain static, and planners must recognize that the findings might not only reveal immediate outputs and outcomes, but also inform how to address making course corrections along the way. In this case, indicators under each of the rationales were not compared with one another, however the findings demonstrated great strides in regard to equity and democracy in the case of Hawaii's WPs. Due to the limited time frame for this research, comparing the impact of each of the rationales to one another, and whether they represent equal spheres for evaluation was not undertaken, but certainly could serve as a meaningful framework for further inquiry in future research.

7.5 Limitations and Further Research

This research has sought to offer a holistic approach to how we could conceptualize an evaluation of a CNRM group's efforts. In taking a holistic approach, and including four rationales upon which to build various theories of change, this research also limited the level of depth with which each of these rationales could be assessed. For example, as noted in Chapter 4:, only one theory of change was undertaken for each of the rationales studied. In reality, each rationale could tell a different story, which would then require different indicators. Future research focusing on various theories of change under a similar rationale might also be useful.

The survey instrument (the structured questionnaire in Appendix C) utilized to gather information systematically from WP Coordinators contained questions that may have led to unintended misinterpretation. If this survey is administered again, the list of activities that WPs conduct would have to be amended. The list of activities presented in the questionnaire included Watershed Resource/Ecosystem Monitoring; Ungulate Control; Feral Animal Control (non-ungulate); Aquatic Pollutant Management; Invasive Weed Control; Public Education and Outreach; Management Infrastructure/Coordination; Fire Control; Vegetation/Rare Species Enhancement/Protection; Native Species Enhancement; Human Activities Management; and Fencing. This list was consolidated after a review of the literature and support from the State's WPP. However, after the data compilation was completed, there appeared to be confusion about what each of these activities may entail, and thus possible replication of activities that might fall into multiple categories should be eliminated prior to asking WPs about activities they perform. For example, feral animal control and fencing have similar goals, and management/infrastructure coordination is unclear. In future assessments, more specific categories of activities conducted would be desirable.

While this research has considered non-partner community member input (whether and how it is received and taken into account), there are essentially no non-partner community member voices included in the findings here that was gathered directly from such community members. In future research, it would be important to assess equity, democracy, efficiency, and ecological integrity from their perspectives as well. However, because the watershed areas managed by the WPs span across so many acres, it may prove difficult to identify exactly who is, and who is not a potentially impacted community member or stakeholder.

This research did not attempt to look at how public funding directed at environmental management may have changed over time, or considered how conducting management activities might have shifted from a public agency role, to management increasingly being outsourced to "specialists" funded with "soft funds".

An inquiry into how this shift might have impacted (or might impact) watershed management would be a valuable study to pursue in the future.

Finally, in the field of evaluation, the degree to which a program has met its goals is often the basis upon which success is measured. However, that approach assumes the ultimate goal of such a program is in itself a "good" goal worth striving for. In this case, this research has assumed that WP activities are in themselves worthwhile endeavors that will to lead to improvements to Hawai'i's watersheds and ultimately to overall groundwater re-charge. While replenishing Hawai'i's forest cover is one way to replenish groundwater, "The main factors limiting groundwater availability in the State of Hawai'i are saltwater intrusion, the reduction of discharge to streams and the ocean, and lowering of water levels" (Stephen B. Gingerich & Delwyn S. Oki, 2000, p. 6). The management activities of the WPs have focused specifically on increasing infiltration of water (such as managing the soils of native forests by reducing compacting caused by the trampling of feral animals). However, many of the indicators proposed in this research and currently being tracked by the State's WPP focus instead on the degree to which forest cover has increased, or on the recovery of native ecosystems, topics which are only indirectly related to water infiltration. In future studies, distinguishing between the goals of re-creating a native ecosystem and actually increasing water infiltration to increase groundwater re-charge would be invaluable.

APPENDIX A: Institutional Review Board Human Studies Program Exemption

Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I® MĀNOA

May 20, 2015

TO: Sara Bolduc
Principal Investigator
Urban & Regional Planning

FROM: Denise A. Lin-DeShetler, MPH, MA
Director

SUBJECT: CHS #23110- "Strategies for Community Inclusiveness in Environmental Governance: A Study of Watershed Partnerships in Hawaii"

This letter is your record of the Human Studies Program approval of this study as exempt.

On May 20, 2015, the University of Hawai'i (UH) Human Studies Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45CFR 46.101(b)(Exempt Category 2,4).

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at http://www.hawaii.edu/irb/html/manual/appendices/A/belmont.html.

Exempt studies do not require regular continuing review by the Human Studies Program. However, if you propose to modify your study, you must receive approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via email at uhirb@hawaii.edu. (The subject line should read: Exempt Study Modification,) The Human Studies Program may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify the Human Studies Program when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the Human Studies Program at 956-5007 or uhirb@hawaii.edu. We wish you success in carrying out your research project.

1960 East-West Road
Biomedical Sciences Building B104
Honolulu, Hawai'i 96822
Telephone: (808) 956-5007
Fax: (808) 956-8683
An Equal Opportunity/Affirmative Action Institution

APPENDIX B: Informal Interview Guide

1. INTROS and PROTOCOLS
    a. Who should I be talking to? "Hierarchy", history (not the dirt on people, but just so I know who is who and who is most involved, who has been there the longest, and who the players are).
    b. Who should I not? ☺
    c. Partners: Are they volunteers? Who is paid versus non-paid?
2. MEETINGS
    a. Do you have weekly meetings? Monthly? Yearly?
    b. Do all the partnerships meet together once a year
    c. Are any of these meetings open to the public?
    d. Who attends?
3. EVALUATION/REPORTING
    a. What are the reporting requirements like (yearly, one per partnership, or one report for the whole Association?)
    b. Who drafts it?
    c. Is the report available?
    d. How could I get? Is that feasible?
4. DATA
    a. How do you measure success? In order to ensure future funding, you must have to show you have met some milestones each year. How do you do that?
    b. What is currently being tracked (I could just see that in the reports)
    c. What would be desirable?
    d. Is there anything you think I could help with in terms of evaluation?
5. FEASIBILITY OF ENGAGING PARTNERSHIPS
    a. Survey: Would anyone participate?
    b. Are there existing needs? Maybe I could tag onto an existing survey, or the other way around?
6. EDUCATION AND OUTREACH
    a. Who manages?
    b. In all locations?

APPENDIX C: Program-Wide Structured Questionnaire Instrument

Watershed Partnership Organizational Questionnaire

Department of Urban and Regional Planning — University of Hawai'i Mānoa

Aloha and thank you for taking the time to take this follow-up questionnaire. (CLICK NEXT AT BOTTOM TO GET STARTED!!!)

This questionnaire will inform my PhD research on decision making in collaborative groups. I hope this survey uncovers many of your successful strategies for doing this, and that your achievements in the Watershed Partnerships can serve as examples for other places.

Your time is valuable. This questionnaire consists of 13 questions and should not take you more than 20 minutes to complete. While some questions may require thought, please respond to the best of your knowledge, and feel free to answer "I don't know/ Not sure" when in doubt.

If necessary, you can break off and come back to the survey from the link so long as you're on the same computer.

All questions in this survey pertain to your specific watershed management area (not to the statewide Association of Watershed Partnerships (HAWP). When we mention "non-partner community members", we are referring to people who are stakeholders within your management area or immediately connected to your management area, but are not members of your partnership.

Be assured that all of your answers will remain confidential and the results of this questionnaire will not identify anyone or any particular Watershed Partnership by name.

THANK YOU! Do not hesitate to call or email me should you have any questions or concerns.
Please click "NEXT" at the bottom of this page to get started!

Sara

Sara Bolduc
University of Hawaii
Department of Urban and Regional Planning
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Watershed Partnership Organizational Questionnaire

Department of Urban and Regional Planning

University of Hawai'i Mānoa

* 1. Which Watershed Partnership organization are you part of? (CHECK ONE)

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Department of
Urban and Regional Planning

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Manoa

* 2. Which of these activities does your Watershed Partnership perform? (SELECT ALL THAT APPLY)

- [ ] Watershed Resource/Ecosystem Monitoring
- [ ] Ungulate Control
- [ ] Feral Animal Control (non-ungulate)
- [ ] Aquatic Pollutant Management
- [ ] Invasive Weed Control
- [ ] Public Education and Outreach
- [ ] Management Infrastructure/Coordination
- [ ] Fire Control
- [ ] Vegetation/Rare Species Enhancement/ Protection
- [ ] Native Species Enhancement
- [ ] Human Activities Management
- [ ] Fencing
- [ ] Other (please specify)

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* 3. What are the TOP 2 activities that you feel you have made the MOST progress on in the last 5 years? Please choose ONE answer in this Q3 and the OTHER in the following Q4.

- ◯ Watershed Resource/Ecosystem Monitoring
- ◯ Ungulate Control
- ◯ Feral Animal Control (non-ungulate)
- ◯ Aquatic Pollutant Management
- ◯ Invasive Weed Control
- ◯ Public Education and Outreach
- ◯ Management Infrastructure/Coordination
- ◯ Fire Control
- ◯ Vegetation/Rare Species Enhancement/ Protection
- ◯ Native Species Enhancement
- ◯ Human Activities Management
- ◯ Fencing
- ◯ Other (please specify)

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* 4. Please choose the OTHER of the TOP 2 activities that you feel you have made the MOST progress on in the last 5 years.

- ◯ Watershed Resource/Ecosystem Monitoring
- ◯ Ungulate Control
- ◯ Feral Animal Control (non-ungulate)
- ◯ Aquatic Pollutant Management
- ◯ Invasive Weed Control
- ◯ Public Education and Outreach
- ◯ Management Infrastructure/Coordination
- ◯ Fire Control
- ◯ Vegetation/Rare Species Enhancement/ Protection
- ◯ Native Species Enhancement
- ◯ Human Activities Management
- ◯ Fencing
- ◯ Other (please specify)

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Watershed Partnership Organizational Questionnaire

Department of Urban and Regional Planning — University of Hawai'i Mānoa

* 5. For each of the activities your specific Watershed Partnership performs, to what degree do you feel these are having a positive impact on the OVERALL HEALTH of the watershed area you manage? (FOR THE ACTIVITIES YOU DO NOT PERFORM, JUST SELECT DOES NOT APPLY)

	Large WATERSHED-WIDE Impact	Some WATERSHED-WIDE Impact	Some LOCALIZED Impact	No real noticeable Impact	Does not apply
Watershed/Resource/Ecosystem Monitoring	○	○	○	○	○
Ungulate Control	○	○	○	○	○
Feral Animal Control (non-ungulate)	○	○	○	○	○
Aquatic Pollutant Management	○	○	○	○	○
Invasive Weed Control	○	○	○	○	○
Public Education and Outreach	○	○	○	○	○
Management Infrastructure	○	○	○	○	○
Fire Control	○	○	○	○	○
Vegetation/Rare Species Enhancement/Protection	○	○	○	○	○
Sediment Ponds Management	○	○	○	○	○
Native Species Enhancement	○	○	○	○	○
Human Activities Management	○	○	○	○	○
Fencing	○	○	○	○	○

Other (please specify)

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* 6. Which of these best describes how important including non-partner community member participation in your specific partnership activities has been over the last 5 years?

- ◯ Very Important
- ◯ Important
- ◯ Somewhat Important
- ◯ Not Important
- ◯ Not sure /Don't know/ Does not apply

* 7. Please tell me about your Watershed Partnership's attitudes and approaches for each of the four possible actions below to receive feedback from non-partner community members over the last 5 years? (FOR EACH ONE, SELECT ALL ANSWERS THAT APPLY)

	We support this idea	We have a range of informal ideas and/or activities to address this	We have a formal rule, or policy that says we must do this	We do not support this idea	Don't know/ Not sure
Helping non-partner stakeholders express their views	☐	☐	☐	☐	☐
Taking non-partner stakeholder views into account	☐	☐	☐	☐	☐
Involving non-partner stakeholders in our decision-making process (such as planning activities or setting goals)	☐	☐	☐	☐	☐
Allowing non-partner stakeholders to share power and responsibility of decision-making with us	☐	☐	☐	☐	☐

Please feel free to explain why you have not supported/implemented any/some of these actions OR reasons why you may sometimes be generally cautious about feedback from non-partner community members:

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Watershed Partnership Organizational Questionnaire

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* 8. How often have each of the following ISSUES been raised by NON-PARTNER COMMUNITY MEMBERS in your management area over the last 5 years? (PLEASE ANSWER ALL.)

	This issue comes up FREQUENTLY	This issue comes up FROM TIME TO TIME	This issue NEVER comes up	Not Sure/ Don't Know/Does Not Apply
Lack of open space	○	○	○	○
Threat of catastrophic fire	○	○	○	○
Lack of economic prosperity	○	○	○	○
Complaints about regulation/permitting	○	○	○	○
Property rights	○	○	○	○
Population growth	○	○	○	○
Access to native cultural practices (such as gathering)	○	○	○	○
Access to recreational activities (including hunting)	○	○	○	○
Inadequate water supply	○	○	○	○
Impaired water quality	○	○	○	○
Threatened species or habitat	○	○	○	○
Conflict among stakeholders	○	○	○	○
Risk of damaging floods	○	○	○	○

* 9. To the best of your knowledge, over the last 5 years, what sort of an effect has your particular partnership had in addressing these issues, if any? (PLEASE ANSWER ALL.)

	Very Positive Effect	Positive Effect	No Particular Effect	Negative Effect	Very Negative Effect	Don't Know/Not Sure/ Does not Apply
Inadequate water supply	○	○	○	○	○	○
Impaired water quality	○	○	○	○	○	○
Threatened species or habitat	○	○	○	○	○	○
Access to recreational activities (including hunting)	○	○	○	○	○	○
Complaints about regulation/permitting	○	○	○	○	○	○
Property rights	○	○	○	○	○	○
Conflict among stakeholders	○	○	○	○	○	○
Access to native cultural practices (such as gathering)	○	○	○	○	○	○
Lack of open space	○	○	○	○	○	○
Risk of damaging floods	○	○	○	○	○	○
Lack of economic prosperity	○	○	○	○	○	○
Threat of catastrophic fire	○	○	○	○	○	○
Population growth	○	○	○	○	○	○

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University of Hawai'i Manoa

* 10. To your knowledge, how often has your organization received FEEDBACK FROM NON-PARTNER COMMUNITY MEMBERS from each of these strategies or sources over the last 5 years? (CHECK ONE FREQUENCY FOR EACH TYPE OF TECHNIQUE.)

	More than 3 times	1-2 times	Never	Don't know/ Not Sure/ Does not Apply
Federal Environmental Review (NEPA) for a project you initiated	○	○	○	○
State Environmental Review (HEPA - HRS Chapter 343) for a project you initiated	○	○	○	○
City/County level hearings (such as for Land Use Change and Plan Amendments) for a project you initiated	○	○	○	○
Formal agreements such as Memorandum of Understandings (MOUs, MOAs etc.)	○	○	○	○
Court ordered mandate	○	○	○	○
Active protest of one or more of our ongoing efforts	○	○	○	○
Focus groups or meetings you initiated	○	○	○	○
Public opinion surveys you initiated	○	○	○	○
Feedback gained from educational event you initiated	○	○	○	○

* 11. Have any of those same feedback/consultation strategies influenced which activities your organization performs, or what goes into your management plan?

	Feedback ensuing from this strategy has...
Federal Environmental Review (NEPA) for a project you initiated	
State Environmental Review (HEPA - HRS Chapter 343) for a project you initiated	

Feedback ensuing from this strategy has...	
City/County Level Hearings (such as for Land Use Change and Plan Amendments) for a project you initiated	
Formal agreements such as Memorandum of Understandings or Agreements (other than with existing partnership partners)	
Court ordered mandate	
Active protest of one or more of our ongoing efforts	
Focus Groups or meetings you initiated	
Public Opinion Surveys you initiated	
Feedback gained from educational event you initiated	

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* 12. Can you think of any other feedback/consultation strategies that have influenced the activities your organization performs or the contents of your management plan?

- ◯ Yes
- ◯ No

If yes, please specify

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* 13. This final question focuses on how decisions are made in your particular Watershed Partnership. What decision-making mechanism do you most often use to make decisions about activities, visions or goals for your partnership? (CHOOSE ONE)

- ○ Single vote by one designated member
- ○ Voting among board of directors only
- ○ Simple majority (51% minimum approval of all members)
- ○ Super majority (80% minimum approval of all members)
- ○ Total consensus or unanimity among all members
- ○ Other (please explain below)

14. THANK YOU! THIS COMPLETES OUR SURVEY! Do you have additional comments about the structure of this survey, or have additional thoughts/ideas you feel we need to consider but failed to ask you about?

BIBLIOGRAPHY

2012 Hawaii Revised Statutes :: TITLE 12. CONSERVATION AND RESOURCES :: 195. Natural Area Reserves System :: 195-1 Findings and declaration of necessity. (2012). Retrieved January 15, 2018, from https://law.justia.com/codes/hawaii/2012/title-12/chapter-195/section-195-1/

Ansell, C., & Gash, A. (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571. https://doi.org/10.1093/jopart/mum032

Arnstein, S. R. (1969). A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*, *35*(4), 216–224. https://doi.org/10.1080/01944366908977225

Arrow, K. J. (2012). *Social Choice and Individual Values*. Yale University Press.

Bäckstrand, K. (2006). Democratizing Global Environmental Governance? Stakeholder Democracy after the World Summit on Sustainable Development. *European Journal of International Relations*, *12*(4), 467–498. https://doi.org/10.1177/1354066106069321

Bailey, N. (2010). Understanding community empowerment in urban regeneration and planning in England: putting policy and practice in context. *Planning, Practice & Research*, *25*(3), 317–332.

Bayman, J. M., & Dye, T. S. (2013). Hawaii's past in a world of Pacific islands. *SAAarchaeological Record*, 44.

Belton, L. R., & Jackson-Smith, D. (2010). Factors influencing success among collaborative sage-grouse management groups in the western United States. *Environmental Conservation*, *37*(3), 250–260.

Berkes, F. (1999). *Sacred ecology: traditional ecological knowledge and management systems*. Taylor & Francis, Philadelphia.

Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, *90*(5), 1692–1702. https://doi.org/10.1016/j.jenvman.2008.12.001

Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *Ecological Applications*, *10*(5), 1251–1262. https://doi.org/10.1890/1051-0761(2000)010[1251:ROTEKA]2.0.CO;2

Biermann, F., Pattberg, P., van Asselt, H., & Zelli, F. (2009). The Fragmentation of Global Governance Architectures: A Framework for Analysis. *Global Environmental Politics*, *9*(4), 14–40. https://doi.org/10.1162/glep.2009.9.4.14

Bloomfield, P. (2006). The Challenging Business of Long-Term Public–Private Partnerships: Reflections on Local Experience. *Public Administration Review*, *66*(3), 400–411. https://doi.org/10.1111/j.1540-6210.2006.00597.x

Brauman, K. A., Freyberg, D. L., & Daily, G. C. (2010). Forest structure influences on rainfall partitioning and cloud interception: A comparison of native forest sites in Kona, Hawai'i. *Agricultural and Forest Meteorology*, *150*(2), 265–275. https://doi.org/10.1016/j.agrformet.2009.11.011

Brinkerhoff, D. W., & Brinkerhoff, J. M. (2011). Public–private partnerships: Perspectives on purposes, publicness, and good governance. *Public Administration and Development*, *31*(1), 2–14. https://doi.org/10.1002/pad.584

Bryson, J. M., & Crosby, B. C. (1992). *Leadership for the common good: Tackling public problems in a shared-power world*. Jossey-Bass.

Buckle, L. G., & Thomas-Buckle, S. R. (1986). Placing environmental mediation in context: Lessons from "failed" mediations. *Environmental Impact Assessment Review*, *6*(1), 55–70. https://doi.org/10.1016/0195-9255(86)90040-5

Burrows, C. (1989). Hawaiian conservation values and practices. *Conservation Biology in Hawaii*, 203–213.

Cole, R. J., & Litton, C. M. (2014). Vegetation response to removal of non-native feral pigs from Hawaiian tropical montane wet forest. *Biological Invasions*, *16*(1), 125–140. https://doi.org/10.1007/s10530-013-0508-x

Conley, A., & Moote, M. A. (2003). Evaluating Collaborative Natural ResourceManagement. *Society & Natural Resources*, *16*(5), 371–386. https://doi.org/10.1080/08941920309181

Connell, J. P., & Kubisch, A. C. (1998). Applying a theory of change approach to the evaluation of comprehensive community initiatives: progress, prospects, and problems. *New Approaches to Evaluating Community Initiatives*, *2*(15–44), 1–16.

Costa-Pierce, B. A. (1987). Aquaculture in Ancient Hawaii. *BioScience*, *37*(5), 320–331. https://doi.org/10.2307/1310688

Cox, T. R. (1992). The Birth of Hawaiian Forestry: The Web of Influences. *Pacific Historical Review*, *61*(2), 169–192. https://doi.org/10.2307/3640128

Delmas, M. A., & Young, O. R. (2009). *Governance for the Environment: New Perspectives*. Cambridge University Press.

Department of Land and Natural Resources, Division of Forestry and Wildlife State of Hawaii. (n.d.). *Report to the Legislature Relating to the Natural Area Reserves System, Natural Area Partnership Program, and The Financial Condition of the Natural Area Reserve Fund (1991,1992, 1997-2017)*. Retrieved from https://dlnr.hawaii.gov/reports/reports-to-the-legislature/

Derrickson, S. a. K., Robotham, M. P., Olive, S. G., & Evensen, C. I. (2002). Watershed Management and Policy in Hawaii: Coming Full Circle1. *JAWRA Journal of the American Water Resources Association*, *38*(2), 563–576. https://doi.org/10.1111/j.1752-1688.2002.tb04338.x

Diamond, J. M. (1999). *Guns, Germs, and Steel: The Fates of Human Societies*. New York: W. W. Norton & Company.

Dryzek, J. S. (2000). *Deliberative Democracy and Beyond: Liberals, Critics, Contestations*. Oxford University Press.

Dryzek, J. S., & List, C. (2003). Social Choice Theory and Deliberative Democracy: A Reconciliation. *British Journal of Political Science*, *33*(1), 1–28. https://doi.org/10.1017/S0007123403000012

Dunkell, D. O., Bruland, G. L., Evensen, C. I., & Litton, C. M. (2011). Runoff, Sediment Transport, and Effects of Feral Pig (Sus scrofa) Exclusion in a Forested Hawaiian Watershed. *Pacific Science*, *65*(2), 175–194. https://doi.org/10.2984/65.2.175

Dye, T. S., & Pantaleo, J. (2010). Age of the O18 site, Hawai'i. *Archaeology in Oceania*, *45*(3), 113–119. https://doi.org/10.1002/j.1834-4453.2010.tb00087.x

Fisher, R. (1987). *Getting to Yes: How To Negotiate Agreement Without Giving In* (Unabridged edition). New York: Simon & Schuster Audio.

Forester, J. (1999). *The Deliberative Practitioner: Encouraging Participatory Planning Processes*. MIT Press.

Fortmann, L., Roe, E., & van Eeten, M. (2001). At the threshold between governance and management: community-based natural resource management in Southern Africa. *Public Administration and Development*, *21*(2), 171–185. https://doi.org/10.1002/pad.156

Fung, A., & Wright, E. O. (2003). *Deepening democracy: Institutional innovations in empowered participatory governance* (Vol. 4). Verso.

Funnell, S. C., & Rogers, P. J. (2011). *Purposeful Program Theory: Effective Use of Theories of Change and Logic Models*. John Wiley & Sons.

Gerlak, A. K., & Heikkila, T. (2006). Comparing Collaborative Mechanisms in Large-Scale Ecosystem Governance. *Natural Resources Journal*, *46*(3), 657–707.

German, L., & Taye, H. (2008). A framework for evaluating effectiveness and inclusiveness of collective action in watershed management. *Journal of International Development*, *20*(1), 99–116. https://doi.org/10.1002/jid.1430

Giambelluca, T. W., Chen, Q., Frazier, A. G., Price, J. P., Chen, Y.-L., Chu, P.-S., … Delparte, D. M. (2012). Online Rainfall Atlas of Hawai'i. *Bulletin of the American Meteorological Society*, *94*(3), 313–316. https://doi.org/10.1175/BAMS-D-11-00228.1

Glover, T. D., Stewart, W. P., & Gladdys, K. (2008). Social Ethics of Landscape Change Toward Community-Based Land-Use Planning. *Qualitative Inquiry*, *14*(3), 384–401.

Graham, J., Amos, B., & Plumptre, T. (2003). Principles for good governance in the 21st century. *Policy Brief*, *15*. Retrieved from http://www.growourregion.ca/images/file/governance/policybrief15_0.pdf

Gutrich, J., Donovan, D., Finucane, M., Focht, W., Hitzhusen, F., Manopimoke, S., … Sasmitawidjaja, V. (2005). Science in the public process of ecosystem management: lessons from Hawaii, Southeast Asia, Africa and the US Mainland. *Journal of Environmental Management*, *76*(3), 197–209. https://doi.org/10.1016/j.jenvman.2005.01.015

Hardin, R. (1990). PUBLIC CHOICE VERSUS DEMOCRACY. *Nomos*, *32*, 184–203.

Harris, N. (2002). Collaborative planning. *Planning Futures: New Directions for Planning Theory*, 21–43.

Healey, P. (1992). Planning through debate: the communicative turn in planning theory. *Town Planning Review*, *63*(2), 143.

Healey, P. (2003). Collaborative Planning in Perspective. *Planning Theory*, *2*(2), 101–123. https://doi.org/10.1177/14730952030022002

Healy, P. (1997). *Collaborative Planning: Shaping Places in Fragmented Societies*. UBC Press.

HI Rev Stat § 195-6.6. (2013). 2013 Hawaii Revised Statutes :TITLE 12. CONSERVATION AND RESOURCES :195. Natural Area Reserves System :195-6.6 Reports. Retrieved January 15, 2018, from https://law.justia.com/codes/hawaii/2013/title-12/chapter-195/section-195-6.6/

Innes, J. E. (1995). Planning Theory's Emerging Paradigm: Communicative Action and Interactive Practice. *Journal of Planning Education and Research*, *14*(3), 183–189. https://doi.org/10.1177/0739456X9501400307

Izuka, S. K., Engott, J. A., Rotzoll, K., Bassiouni, M., Johnson, A. G., Miller, L. D., & Mair, A. (2018). *Volcanic aquifers of Hawai'i—Hydrogeology, water budgets, and conceptual models* (USGS Numbered Series No. 2015–5164) (p. 172). Reston, VA: U.S. Geological Survey. Retrieved from http://pubs.er.usgs.gov/publication/sir20155164

Jokiel, P. L., Rodgers, K. S., Walsh, W. J., Polhemus, D. A., & Wilhelm, T. A. (2011). Marine Resource Management in the Hawaiian Archipelago: The Traditional Hawaiian System in Relation to the Western Approach. *Journal of Marine Biology*, *2011*, 1–16. https://doi.org/10.1155/2011/151682

Josayma, C., & Burgett, J. (1996). *Facilitating collaborative planning in Hawai'i's Natural Area Reserves*.

Kagawa Aurora, Sack Lawren, Duarte Ka'eo, & James Shelley. (2009). Hawaiian native forest conserves water relative to timber plantation: Species and stand traits influence water use. *Ecological Applications*, *19*(6), 1429–1443. https://doi.org/10.1890/08-1704.1

Kame'Eleihiwa, L. (1992). *Native Land and Foreign Desires: Pehea LA E Pono Ai? How Shall We Live in Harmony?* Honolulu: Bishop Museum Pr.

Kelly, M. (1980). Land Tenure in Hawaii. *Amerasia Journal*, *7*(2), 57–73. https://doi.org/10.17953/amer.7.2.511t06q181783311

Kelly, M. (1989). Dynamics of production intensification in pre-contact Hawai 'i. *What's New*, 82–105.

Kelly, M. (1997). Ahupua'a: a Kanaka Maoli system of natural resources enhancement, utilization and preservation. *Ethnic Studies Dept University of Hawai 'i, Honolulu*.

Kido, M. (2006). *A GIS-based watershed health index for the state of Hawaii*. Technical report to the Hawaii Department of Health, Environmental Health Administration—Environmental Planning Office.

Kirch, P. V. (1982). The impact of the prehistoric Polynesians on the Hawaiian ecosystem.

Koontz, T. M., & Johnson, E. M. (2004). One size does not fit all: Matching breadth of stakeholder participation to watershed group accomplishments. *Policy Sciences*, *37*(2), 185–204.

Koontz, T. M., & Thomas, C. W. (2006). What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management? *Public Administration Review*, *66*, 111–121. https://doi.org/10.1111/j.1540-6210.2006.00671.x

Kumar, A., & Paddison, R. (2000). Trust and collaborative planning theory: The case of the Scottish planning system. *International Planning Studies*, *5*(2), 205–223.

Lasker, R. D., Weiss, E. S., & Miller, R. (2001). Partnership Synergy: A Practical Framework for Studying and Strengthening the Collaborative Advantage. *Milbank Quarterly*, *79*(2), 179–205. https://doi.org/10.1111/1468-0009.00203

Leach, W. D. (2006). Collaborative Public Management and Democracy: Evidence from Western Watershed Partnerships. *Public Administration Review*, *66*, 100–110. https://doi.org/10.1111/j.1540-6210.2006.00670.x

Leach, W. D., Pelkey, N. W., & Sabatier, P. A. (2002). Stakeholder partnerships as collaborative policymaking: Evaluation criteria applied to watershed management in California and Washington. *Journal of Policy Analysis and Management*, *21*(4), 645–670. https://doi.org/10.1002/pam.10079

Lemos, M. C., & Agrawal, A. (2006). Environmental Governance. *Annual Review of Environment and Resources*, *31*(1), 297–325. https://doi.org/10.1146/annurev.energy.31.042605.135621

Leslie A. Duram, K. G. B. (1999). Insights and Applications Assessing Public Participation in U.S. Watershed Planning Initiatives. *Society & Natural Resources*, *12*(5), 455–467. https://doi.org/10.1080/089419299279533

Levy, N. (1975). Native Hawaiian Land Rights. *California Law Review*, 848.

Lockwood, M., Davidson, J., Curtis, A., Stratford, E., & Griffith, R. (2010). Governance Principles for Natural Resource Management. *Society & Natural Resources*, *23*(10), 986–1001. https://doi.org/10.1080/08941920802178214

Lövbrand, E., Rindefjäll, T., & Nordqvist, J. (2009). Closing the Legitimacy Gap in Global Environmental Governance? Lessons from the Emerging CDM Market. *Global Environmental Politics*, *9*(2), 74–100. https://doi.org/10.1162/glep.2009.9.2.74

McGregor, D. P. (1996). An Introduction to the Hoa'aina and Their Rights.

Minerbi, L. (1999). Indigenous management models and protection of the ahupua 'a. *Social Process in Hawai 'i*, *39*, 208–225.

Nigel Taylor. (1998). *Urban planning theory since 1945*. Sage.

Oki, D. S. (2005). *Numerical simulation of the effects of low-permeability valley-fill barriers and the redistribution of ground-water withdrawals in the Pearl Harbor area, Oahu, Hawaii*. US Geological Survey.

Osborne, S. P. O. (2006). The New Public Governance? *Public Management Review*, *8*(3), 377–387. https://doi.org/10.1080/14719030600853022

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action (Political Economy of Institutions and Decisions)*. Cambridge University Press. Retrieved from http://www.amazon.ca/exec/obidos/redirect?tag=citeulike09-20&path=ASIN/0521405998

Ostrom, E. (2008). *Design Principles of Robust Property-Rights Institutions: What Have We Learned?* (SSRN Scholarly Paper No. ID 1304708). Rochester, NY: Social Science Research Network. Retrieved from http://papers.ssrn.com/abstract=1304708

Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, *19*(3), 354–365. https://doi.org/10.1016/j.gloenvcha.2009.06.001

Perkins, P. E. (Ellie). (2011). Public participation in watershed management: International practices for inclusiveness. *Physics and Chemistry of the Earth, Parts A/B/C*, *36*(5–6), 204–212. https://doi.org/10.1016/j.pce.2010.02.004

Peters, B. G., & Pierre, J. (1998). Governance Without Government? Rethinking Public Administration. *Journal of Public Administration Research and Theory*, *8*(2), 223–243.

Pukui, M. K. (1983). *"Olelo No"eau: Hawaiian Proverbs & Poetical Sayings*. Bishop Museum Press.

Redford, K. H., & Stearman, A. M. (1993). Forest-Dwelling Native Amazonians and the Conservation of Biodiversity: Interests in Common or in Collision? *Conservation Biology*, *7*(2), 248–255. https://doi.org/10.2307/2386422

Reilly, T. (1998). Communities in Conflict: Resolving Differences through Collaborative Efforts in Environmental Planning and Human Service Delivery. *Journal of Sociology and Social Welfare*, *25*, 115.

Riker, W. H. (1982). *Liberalism against populism: A confrontation between the theory of democracy and the theory of social choice*. Freeman San Francisco.

Rocha, E. M. (1997). A ladder of empowerment. *Journal of Planning Education and Research*, *17*(1), 31–44.

Rodgers, K. S., Kido, M. H., Jokiel, P. L., Edmonds, T., & Brown, E. K. (2012). Use of Integrated Landscape Indicators to Evaluate the Health of Linked Watersheds and Coral Reef Environments in the Hawaiian Islands. *Environmental Management*, *50*(1), 21–30. https://doi.org/10.1007/s00267-012-9867-9

Sabatier, P. A. (2005). *Swimming Upstream: Collaborative Approaches To Watershed Management*. MIT Press.

Sager, T. (2001). A planning theory perspective on the EIA. *EIA, Large Development Projects and Decision-Making in the Nordic Countries. Stockholm: Nordregio*, 197–218.

Shier, H. (2001). Pathways to participation: openings, opportunities and obligations. *Children & Society*, *15*(2), 107–117. https://doi.org/10.1002/chi.617

Shonk, K. (2017, November 28). Six Guidelines for "Getting to Yes." Retrieved March 8, 2018, from https://www.pon.harvard.edu/daily/negotiation-skills-daily/six-guidelines-for-getting-to-yes/

Smith, S. L. (1998). Collaborative Approaches to Pacific Northwest Fisheries Management: The Salmon Experience. *Willamette Journal of International Law and Dispute Resolution*, *6*, 29.

Stame, N. (2004). Theory-based evaluation and types of complexity. *Evaluation*, *10*(1), 58–76.

State of Hawaii, DLNR. (2011). *The Rain Follows the Forest* (A Plan to Replenish Hawaii's Source of Water) (p. 24). Retrieved from https://data.globalchange.gov/file/80a8e24b-6ec3-45d4-a95e-5d3b1afbe419

Stein, D., & Valters, C. (2012). Understanding theory of change in international development.

Stephen B Gingerich, & Delwyn S. Oki. (2000). Ground Water in Hawaii. *USGS*. Retrieved from https://www.higp.hawaii.edu/~scott/GG170/Lab_reading/USGS_fact_sheet_126_00.pdf

The Nature Conservancy, M. P. (2017). *Final Environmental Assessment and Finding of No Significance for the Pakui Watershed Project* (FEA-FONSI). Retrieved from http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-02-08-MO-FEA-Pakui-Watershed.pdf

Weber, E. P. (2000). A New Vanguard for the Environment: Grass-Roots Ecosystem Management as a New Environmental Movement. *Society & Natural Resources*, *13*(3), 237–259. https://doi.org/10.1080/089419200279081

Weiss, C. H. (1998). *Evaluation (2nd edn)*. Upper Saddle River, NJ: Prentice Hall.

Weiss, C. H. (1998). Have we learned anything new about the use of evaluation? *The American Journal of Evaluation*, *19*(1), 21–33.

Wesselink, A., Paavola, J., Fritsch, O., & Renn, O. (2011). Rationales for Public Participation in Environmental Policy and Governance: Practitioners' Perspectives. *Environment and Planning A*, *43*(11), 2688–2704. https://doi.org/10.1068/a44161

Woodcock, D. (2003). To restore the watersheds: early twentieth-century tree planting in Hawai 'i. *Annals of the Association of American Geographers*, *93*(3), 624–635.